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THE FORDNEY TARIFF BILL

IN theory the Fordney Tariff Bill should prove most effective for the protection of American industry. It aims to levy on manufactured articles imposts that will cover the difference between the lower overseas and the higher American cost of production, and safeguard American industries from unfair and perhaps ruinous competition. Yet in actual operation in its present form it might handicap exports and so defeat its avowed purpose, and its efficacy will hinge very largely on the question of appraisal. This involves an issue of transcending importance which is: Shall the United States take the goods of foreigners at their own, or at the American valuation?

It is intimated that unless Americans accept the price ratings given by foreign shippers, often subject to misstatement and exchange fluctuation, our neighbors overseas may retaliate. Be that as it may, American manufacturers are quite willing to take a chance on such retaliation. Certainly no open or covert threats should scare our lawmakers into surrendering the nation's just and logical prerogative of fixing the values of imported goods as rated in the domestic rather than in the foreign market. As a whole the rubber trade is not stirred by the terms of the bill. Hard rubber and some other lines need more protection but no tariff bill is fair to all.

SCIENCE IN RUBBER PLANTATIONS

RULE of thumb methods in the growing of rubber and in the manufacture of rubber goods were profitable when both industries were young and competition mild. Their day, however, is past or passing, and scientific production alone promises success. This has been notably found in the manufacture of rubber goods in the past ten years. A very brief survey of the progress, chemical, mechanical and industrial, shows an advance in scientific knowledge that is marvelous.

That crude rubber production must come under the same law of survival is obvious. It is, therefore, most encouraging to examine the reports that come from the Far East where a brilliant corps of scientists are tirelessly at work upon the problems incident to rubber cultivation. As a preliminary, it may be noted that the many diseases and pests that threatened the Hevea have been halted or exterminated by the British and Dutch savants. Of just as great importance, however, is the work in tree selection that is going on, notably in Medan, Sumatra, under Dr. Heusser.

Briefly, the learned botanist secured records of yield of thousands of trees. From this he observed that one or two trees out of every thousand were big producers of latex. The difference ran from 4 to 10 times as much as the daily product of the rest of the other trees. These big producers were then tested for the dry rubber content of the latex, which was found to vary from 15 to 52 per cent. These selected trees with a latex content from 30 to 35 per cent are called "mother trees," as they are designed to breed the plantings of the future. This is done by budding from the mother tree upon one-year-old Hevea seedlings. Thousands of these buddings have been made and tapping results are eagerly awaited. It is not too much to say that the promise of success is there.

STANDARDIZATION AND SIMPLIFICATION

MINDFUL not merely of the benefit to its own country of more general standardization and simplification, the American section of the International Chamber of Commerce, of which John J. Raskob, vice-president of E. I. du Pont de Nemours & Co., is a leading member, has been urging at the London conference the adoption of such a policy as tending to promote an early return of world-wide normal conditions. The American committee is convinced, it says, that the stagnant stocks of commodi-

ties and congestion in distribution are positively due to lack of standards and excess variety of fabricated products. Proper cooperation and general adoption of engineering standards would no doubt go a long way toward eliminating waste and duplication in the making of commodities in styles, sizes and sorts that are not only confusing but that serve no useful purpose.

Much is being done by private initiative, the United States Bureau of Standards, and the Fabricated Production Department of the Chamber of Commerce of the United States, toward popularizing the slogan, "Standardize and simplify." Were it to be adopted also by the International Chamber of Commerce the friends of real industrial reform might well congratulate themselves on the achievement, as it would indeed be an augury of better times in the very near future.

DETECTING THE INDUSTRIALLY UNFIT

EMPLOYMENT managers can find in the United States Navy's system of detecting the unfit and classifying the fit for various kinds of work much that should be helpful to them in dealing with industrial applicants. Even more than the Army, has the Navy stressed the need of mental as well as physical and other tests. In making the mental test the Navy does not content itself with determining merely the normality or feeble-mindedness of a candidate, but it gets the applicant to reveal in a brief, agreeable, standardized interview his real personality; and accordingly is he indexed and graded. The old-time application blank has been found to be as misleading as the letter of recommendation. It is elusive and one-sided, leaving largely with the man himself the determination of his ability; and undesirables cannot be trusted to record their failures and deficiencies. Under the Navy plan not only is the candidate judged by his appearance, attitude, manner, etc., but he must show whether or not he is a shiftless wanderer, a failure in his school days as well as in his manhood, a man who could not hold any job a year, or one who perhaps is a chronic invalid, whose ailments may be vague enough to him but are very real to a mill manager who must have only "live ones" in his employ, and whose constant struggle is to keep his labor turnover down to normal limits.

EXPENSIVE HOARDING

TRYING hard after the great war to regain its stride, industry in general has no more pressing need than ample liquid capital. Yet we are told by Federal statisticians that a vast amount of funds that should be available for the financing of world enterprises, and that might be easily conserved, is being hoarded. It is stated that of the approximately $65,000,000,000 aggregate annual income of the people of the United States actually less than $20,000,000,000 is now reinvested as productive capital. Economic and financial experts well realize the significance of this colossal wastage, and they have proposed a veritable host of plans for the replenishing of the world's lost capital. While many of them are admirable, none is conceived in a fairer, more whole-hearted, more helpful, or more economically sound spirit than that of the United States Government Loan Organization.

To aid the nation's industries and raise the workers' morale, the Government is making a special appeal to employers to urge and enable their helpers to invest some part of their savings, no matter how small, in Treasury savings securities ranging in denomination from 25-cent thrift stamps to $1,000 certificates. To their great credit numerous employers not only have assured the Government of their support but have been vying with one another to see how large a percentage of their workers they can engage in the commendable work of providing for the "rainy day," and for industrial prosperity.

One of the first to appreciate the merits of the Treasury Department's plan was J. J. Voorhees of the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey. In referring to the introduction of the plan in his factory, he says: "I am sure the plan will be successful because my employes realize it is the easiest and most convenient method by which they can save with a minimum amount of effort on their part."

AS TO THE "GYP"

CONSIDERING the word that has made a place for itself in the tire trade; whence comes it, and exactly what does it mean? When derived from "gypsy" it refers to a sly, irresponsible individual, a wandering, unscrupulous trader. As a noun and not an abbreviation, it means a vulture, with all of that foul bird's appetite for offal. As a verb it relates to trickery and thievery. Thus the trade stigmatizes the maker of, or dealer in, misbranded or unbranded tires, the creator of cut prices, the expert in the tricks incident to the depraved trader. Not bad as modern word creations go.

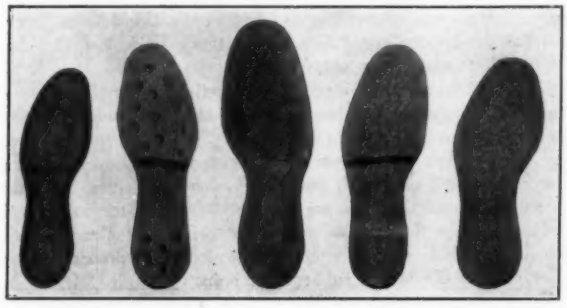
WHILE SO MANY LARGE GROWERS OF COTTON IN THE United States, discouraged by a temporary recession in prices, have greatly reduced their acreage this year, Secretary of Commerce Herbert C. Hoover, with a confidence born of great faith in the future of American industry and fortified with ample information as to national and international needs, has planted 600 acres of his 1,200-acre ranch in the San Joaquin Valley, California, to Pima cotton. It may be true that the cotton demand is now light, and that the carry-over is large, but everything indicates that the demand will soon come back strong, that before long the pendulum must swing the other way, and that real advantage for the cotton-grower lies in being ready to meet the returning demand at advancing prices, rather than in limiting production to bare, present necessities.

The Rubber Sole Up to Date

The Question of Health—Popular Fallacies Concerning Rubber Soles—Wide Use for Rubber Soles—Marketing and Production—Quest for Soling Compounds—Types of Soling Compounds—Unusual Types of Rubber Soles—Modern Shoe Machinery Used—Rubber-Sole Testing Machines

A QUESTION OF HEALTH

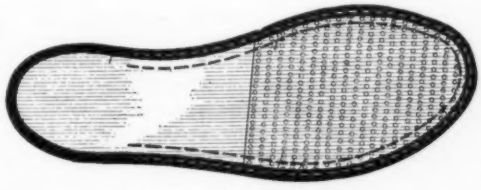
With the drug stores of the world packed with cold remedies, and civilized man coughing, expectorating, suffering, and dying from colds, preventatives should be taken into account far more than they are. What has been done in guarding the throat and nasal passages by isolating coughers, fining the spitters,



TYPES OF RUBBER AND RUBBER-FIBER SOLES

and insisting upon pure air night and day, is excellent. One source of cold-catching, however, is almost totally neglected, and that is through the feet. Here are the largest and most active pores. They are constantly at work throwing off poison. If chilled, this work stops, congestion is brought on, and a cold is the result.

Not that dry cold feet are a menace. It is the cold feet brought about by outside wet or dampness that does the harm. A prolific source of colds is the leather sole, thick or thin, from which the natural oil has been removed. While such a sole may wear well, there is also its quality of absorbing water quickly and as quickly drying out. Such soles, just as soon as they are damp, should no longer be worn, because in their quick drying-out the cold is taken. In other words, take off damp or wet shoes at once, or, better still, wear waterproof soles and let the damp earth, wet grass, or slushy sidewalks do their worst. Certainly, thus shod, there is no danger of catching cold through the feet.



GROSJEAN CORD SOLE

The waterproof rubber sole, if of proper thickness, also keeps the feet much warmer than leather, and without the use of cumbersome insoles; and this means better circulation of the blood. Such equalization of the blood current in turn means less congestion in the respiratory and other organs sensitive to hyperemia or overfulness of the blood vessels; and hence less likelihood of the development of many maladies commonly attributed to this cause. With such a sole it is possible to dispense with the wearing of rubbers and overshoes except in the most stormy weather. Walking may be one of the best forms of exercise, yet every step means more or less jar on the spinal cord and the brain, which is reduced by the elastic and flexible rubber sole that acts as a cushion. Many a sufferer from rheumatism, sciatica, backache, headache, and various nervous ailments has been afforded marked relief by substituting rubber soles for the harsher though time-honored ones of leather.

POPULAR FALLACIES CONCERNING RUBBER SOLES

Many people who ought to know better still cling to the belief that rubber soles act like poultices, that is, that they burn and draw the feet, while leather soles allow the feet to "breathe." The best that can be said of both notions is that they are like half-truths and that they lack scientific proof. Doubtless the earlier makes of soles contained too much rubber and were too heavy, and this caused as much discomfort to people with sensitive feet as the wearing of thick rubber boots. However, in recent years, there has been a wonderful improvement in the manufacture of rubber soles, former sole faults having been quite overcome by intelligent cooperation on the part of the rubber chemist, superintendent, and sales manager.

If rubber really burned or drew the feet there should be some complaint made by the great number of people who mostly unknowingly but with evident satisfaction wear rubber-fiber insoles, which are now used in a large percentage of good quality shoes. As for leather soles allowing the feet to "breathe," the fact is only too patent that the bottom of any well-made leather shoe, composed as it is of layers of tough tanned hide, waxed fabric, and other such material, is simply impermeable to air; and if the feet "breathe," they do so through or above the upper. It is familiar experience that the rubber sole is a boon to sufferers from swollen and tender feet and to those afflicted with corns and bunions; nor does the rubber-soled shoe have to be "broken in" as is necessary so often with leather shoes. Orthopedic surgeons are quoted as saying that the rubber sole allows the muscles of the foot to flex and function more naturally than leather.

WIDE USE FOR RUBBER SOLES

Apart from even the question of health, the modern rubber sole has many points in its favor. It is remarkably durable, often wearing three times as long as a good leather sole, affording miners, marketmen, tanners, abattoir men, and others a perfect foot protection; it saves the shoes of farmers who must walk in moist alkaline fertilizers; its noiseless tread, if placed on children's shoes, affords much relief to tired mothers, and it is a certain advantage to policemen, soldiers, sailors, marines, hunters, hotel, hospital, and other workers. Being an electrical non-conductor, it can safeguard firemen, linemen, motormen, conductors, and others from possibly fatal shocks; it greatly lessens for brakemen, firemen, engineers, and others the harmful vibration of trains and gives them a surer

FOSTER CRIMPED RUBBERIZED FIBER SOLE

footing on car-steps; and it also provides bicyclists, golfers, hikers, fishermen, yachtsmen, and others with an ideal shoe sole.

MARKETING AND PRODUCTION

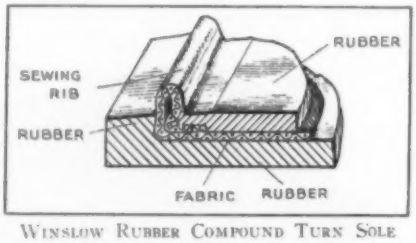
Despite the fact that the rubber sole had proved its right to

a foremost place in the footwear market, it had to fight long and hard for recognition. Some manufacturers of leather shoes persisted in fostering the fallacy that rubber soles did more to harm than to help the feet, and were so wedded to old standards that it was only after insistent calls that they timidly ventured to make shoes with rubber soles as "original equipment." Retailers were equally reluctant to buy or display them, and many unprogressive repair men took every opportunity to "knock" them. The objections made by the cobblers were that the rubber soles tore too easily while being stitched, that they could not be edged or finished as nicely as leather soles, and that bulges or air pockets often developed under the soles. But the man who wanted rubber soles on his shoes, and knew their merits, often thought that the real reason why the cobblers disliked putting on rubber soles was that they wore too long.

FOSTER FRICTION PLUG RUBBER SOLE

Now manufacturers are turning out shoes with rubber soles that cost half the price of leather ones and require fewer operations to attach and finish them, yet are "tailored" as modishly as any leather shoe. Finding that wearers are rapidly discovering the advantages of rubber-soled shoes, retailers are actually adding to their stock and variety, and may soon be pushing sales. The up-to-date repair man scoffs at the idea of any good rubber soling tearing while being sewed on a shoe—a trouble easily avoided by not pulling the stitches too tight. The rubber sole edges, he says, can be buffed and finished in as dressy a fashion as though of leather; and as for bulges or air pockets in the sole center, they need not occur if a workman spreads his cement on evenly. Ordinarily only a full sole is cemented, the taps being generally nailed on. Another objection that is no longer raised is that rubber soles tend to break across the foot. Many of the old-time fiber soles did thus discredit the industry, but the modern sole does not crack.

The rubber soling which will eventually find the widest market is that which most fully meets these requirements: high tensile strength, energy of resilience, light weight (a gravity that will not exceed 1.15), a close grain that will resist cutting, attractive appearance ("blooming" stock being decidedly passé), and the property of holding its original life even in rough service. As a result of intensive research and incessant experimenting, rubber sole manufacturers are now producing several articles that quite possess this exacting combination of qualities, and which are as far ahead of the old-fashioned fiber sole as the nitrogen-tungsten lamp is above the original carbon filament bulb.



WINSLOW RUBBER COMPOUND TURN SOLE

While according the ingenious and enterprising manufacturers their proper share of credit, it may be said that several circumstances favored the development of the modern rubber sole. The war sent the price of leather up to an almost prohibitive price, thus renewing an interest in leather substitutes, and caused a sharp inquiry for rubber or fiber soles. The price of crude rubber dropped to an unheard-of low figure, and the price of reclaimed rubber began to fall rapidly as the value of crude declined, while the volume of rubber scrap, especially discarded tires, which afford an excellent and tough material for soling compounds, began to increase immensely. Indeed, the large amount of high-grade reclaim that has been available of late has played no small part in quantity production of the modern rubber sole.

QUEST FOR SOLING COMPOUNDS

Visioning the time when cattle-raising and leather production would fail to keep pace with the growth of population, and realizing the need of soles that would have all the merits and none of the deficiencies of those made of leather, yet be much cheaper, rubber manufacturers began making soles nearly half a century ago. The early products were heavy, awkward, and practically all rubber. In trying to overcome old prejudices and capture the public fancy a host of compounds was tried, but the results were very discouraging. Then came the fiberized rubber sole, an admirable effort to overcome the shortcomings of the old rubber soles, and which met with a generous popular response. The qualities were as various as the fillings, which included practically every fibrous substance from leather refuse to silk waste and paper pulp.

Costly mistakes were made in marketing. Manufacturers of some of the best goods blundered by making too many different sizes and shapes, either making it hard for shoe men to apply the soles or requiring them to carry too large an assortment. They specialized too much and standardized too little, and made no sustained advance. Some unscrupulous makers injured the trade greatly by flooding the market with inferior soles for which extravagant claims were made and which only aroused resentment against the whole rubber sole industry.

Finally came the modern rubber sole, a real achievement, utilizing all that was good in the soles that went before, obviating all that was bad, and even eclipsing leather to a marked degree while selling much more cheaply. Earlier mistakes in distribution were also avoided. The needs and convenience of manufacturer and repair man were studied, and the material was supplied in stamped-out soles and taps in standard forms and sizes; or in blocks, strips, and sheets from which the shoemaker or cobbler could cut out his own patterns of full and half-soles. The rapidly-growing popularity of these goods, the satisfaction widely expressed, and the lack of fault-finding amply indicate that the modern sole has won the public approval.

TYPES OF SOLING COMPOUNDS

The search for a suitable sole stock to take the place of leather has for many years been conducted by some of the foremost experts in the rubber industry, and numerous patents have been issued in this country and abroad for fabricated materials designed to supplant sole leather. Nearly all of the mixtures thus far used, or proposed, have a certain percentage of wool, cotton, or leather fiber mixed with rubber and vulcanized, the amount of fiber varying from 10 to 25 per cent. Leather fiber figured prominently in the earlier compounds, but now it is rarely used in excess of 5 per cent, the remainder of the fiber content being either of wood or cotton in a flocculent state. A typical modern fiber sole compound is the following:

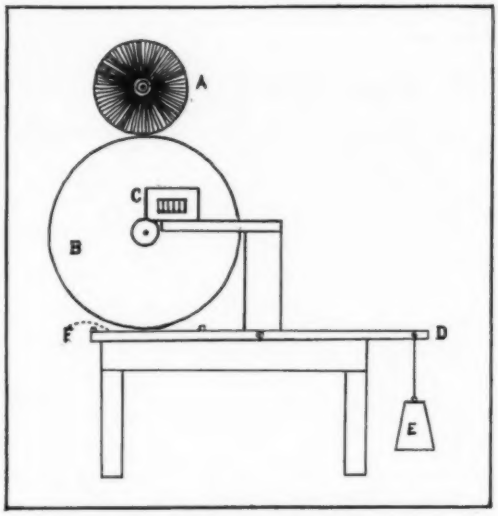
	Per Cent
Leather fiber	3 to 5
Other fiber	5 to 15
New rubber	18 to 20
Corn oil substitute	5 to 7
Asphaltum	2 to 5
Reclaimed rubber	10 to 25
Zinc oxide	18 to 20
Magnesium carbonate	1 to 6
Sulphur	1 to 6

With whiting, lithopone, and litharge.

A Danish sole leather substitute which has given good results is composed of 3 pounds of Pará rubber, 12 pounds of oil of turpentine, mixed after the rubber has dissolved in the turpentine with 3 pounds of 30 per cent ammonia. When the rubber mixture acquires a grayish-white color 45 pounds of leather pulp, which has been exposed to ammonia fumes, are added and the whole kneaded to an even mass.

An English formula for a leather-rubber which, though simple, gave much satisfaction, provided for 20 pounds of caoutchouc, 20 pounds of ground rags or other fiber, and 2 pounds of sulphur.

A non-slip American compound is made up of these ingredients: rubber, 18 pounds; litharge, 10 pounds; whiting, 20 pounds; flowers of sulphur, 11 ounces; lampblack, 8 ounces; and to which



A—WIRE BRUSH; *B*—GRINDSTONE; *C*—SPEED COUNTER; *D*—LEVER ON WHICH SAMPLE IS TESTED; *E*—WEIGHT FORCING SAMPLE AGAINST GRINDSTONE; *F*—BOX FOR RUBBER SOLING SAMPLE

DEVICE FOR TESTING RUBBER SOLING COMPOUNDS

is added coarse emery or other gritty substance in weight equaling the rubber and the other ingredients.

A leather compound designed primarily for horseshoe pads, but which it was stated could be used also for soling, is as follows:

	Parts
Fine Pará rubber	5
Reclaimed rubber	3
Golden sulphuret of antimony	5
Lime	8
Magnesia	3
Zinc oxide	1
Rubber saturated and coated fibers	19
Sulphur	5
Total	48

The batch is vulcanized under 2,000 pounds pressure for 40 minutes. If a more heat-resistant compound is desired, 2 parts of asbestos fiber are added to the other 48 parts, the fiber being either natural or rubber-coated.

An artificial sole composition calls for crude rubber, ground frictioned fabric, sulphur, and an alkali ground up in a mixing mill.

Standard soling for a large percentage of the high-grade rubber shoes now worn is made up of four layers: rubber tread surface, sheeting and friction, felt and cork, and sheeting lining.

UNUSUAL TYPES OF RUBBER SOLES

A rubber sole having for its tread strands of stout cord held together with rubber and stretched across the sole between the toe and the shank—the shank and the heel being of rubber only, or of rubber and fabric—is a comparatively recent invention. In making the sole, after the pattern is stamped from a thin strip or sheet of rubber, the cords are drawn under and over the surface of this strip and held in place above with another and stouter strip or sheet of rubber. The tread strands are cemented with rubber solution to the under side of the lower strip, and the whole vulcanized.

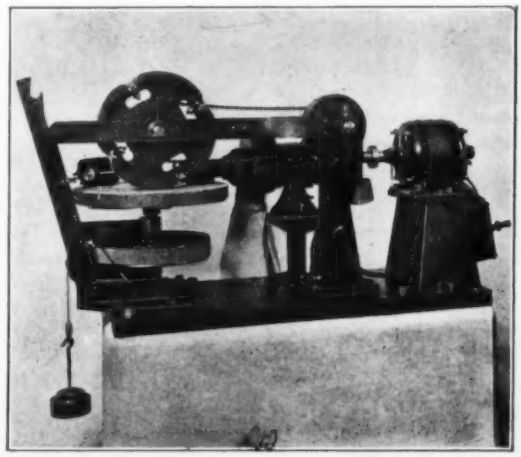
While knurling and corrugations are much used on the soles of rubber boots, rubber sole manufacturers either dispense with them or use such "anti-skid" features in a much more modified form. The typical patterns shown in the illustration vary from the soles having perfectly plain surfaces to the soles having doubly-thickened taps and heels, soles with many small concavities like vacuum cups on thickened tap and heel portions, and soles having crosswise ribbing and other designs intended to give the wearer a firmer foothold. A rubberized crimped or fluted fiber sole and a friction-plug rubber sole having a toughened fabric inset in tap and heel are other types that have found favor.

MODERN SHOE MACHINERY USED

One of the impediments to the progress of the rubber sole has been the fact that such soles have not been adapted to modern shoemaking machinery. Unable with standard apparatus and ordinary factory methods to attach rubber soles to uppers in the making of turn-shoes with single-faced stitches, manufacturers, even though well-disposed toward the innovation, naturally sidestepped the problem, and through this circumstance rubber soles failed to attain the vogue that they had fairly earned. Finally United States Patent No. 1,296,894 was granted to Sidney W. Winslow, Jr., of Beverly, Massachusetts, and assigned to the United Shoe Machinery Co., of Paterson, New Jersey, that met just such a condition, and whereby a rubber compound turn sole could be produced which would enable a manufacturer of leather shoes to make an attractive and serviceable rubber-soled turn shoe with his regular machinery. The inventor contrived a rubber compound sole having imbedded by vulcanization in its upper side a low, upturned, folded fabric sewing-rib following the outline of the sole and but a short distance from the edge. Thus another great difficulty was surmounted and incidentally a decided impetus given to the rubber sole industry. The practically correct compound having been found, an ideal method of attaching the rubber soles to uppers had been devised, capping the climax, as it were.

RUBBER SOLE TESTING MACHINES

Despite the fact that they have produced a material that amply fills every reasonable requirement and more, rubber sole manufacturers are not yet wholly satisfied. They continue making and



BUREAU OF STANDARDS RUBBER SOLE TESTING MACHINE

testing out new compounds in the hope that a still better product may yet be evolved. Simple but efficient is the device used for determining the toughness or wearing quality of the various samples of soling. A grindstone about 8 inches in diameter and 3 inches thick is mounted on a stand. Touching it above is a revolving wire brush which keeps the stone clean, and beneath the stone is a pivoted wooden lever. A sample of soling is fastened to the lever near the grindstone and a 15-pound weight is hung upon the other end of the lever, thus pressing the sample

against the stone. Each piece of soling is thus held until the grindstone has just about worn a hole through it, and an attendant notes the comparative resistance made by each sample to the abrasive action of the whirling stone, the revolutions of which are also indicated by a counter attached to the shaft. This machine can be made easily and cheaply in any shop.

A more elaborate contrivance, employing similar principles, is used by the United States Bureau of Standards in Washington, D. C., for determining the relative values of the materials used for soling army boots and shoes.

Applying and Repairing Rubber Belting

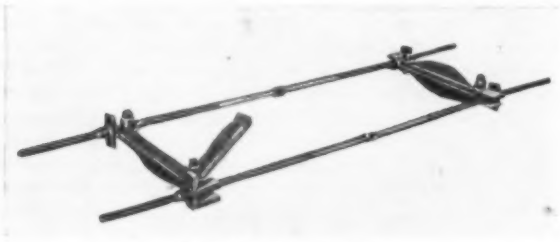
A Bit of History—Leather Belting—Rubber Belting—Wide Field of Usefulness for Rubber Belting—Field Work in Applying and Repairing—The Leather Lacing—Best Lacing Method—Hinge Joint Lacing—Lace and Lap Fastening—Making a Back Splice—Lap Splicing—Diamond Lap Splice

A BIT OF HISTORY

RUBBER belting has been manufactured in the United States since 1836, even before vulcanization was discovered by Goodyear. It was at first a monopoly under the Goodyear patents controlled by Henry Edwards, of Boston. Later it became one of the important lines manufactured by all of the leading mechanical rubber goods producers.

LEATHER BELTING

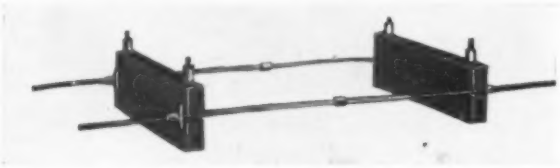
Leather belting for a great many years had been regarded as the only practical material, combining strength, flexibility, gripping power, and endurance, suitable for transmitting power. Excellent as it was and is, machinery users early noted several serious shortcomings in it.



STEEL BELT-STRETCHER

Generally speaking, the leather belt worked well indoors, and even outdoors when the weather was dry, but in the presence of much moisture the leather relaxed and lost much of its grip, necessitating the use of various devices to take up the slack. Cold usually hardens and heat warps leather belting.

Then, too, the leather belt is limited in width, due to the nature of the material; and generally, in the flat form, it could be used only on one side. Too often the leather belts twisted, ran out of line, due to uneven width or thickness, even some apparently high-grade belts being subject to troublesome distortion. Not the least objection was the gradually growing dearness of first-class leather belting. The canvas or cotton belt in various forms was often substituted for the leather in the hope of overcoming some of the drawbacks of the leather belt, but while it is still employed to a large extent in certain lines, it absorbs dampness too easily, is not easily repaired, and unless exceptionally well made, stretches too much.



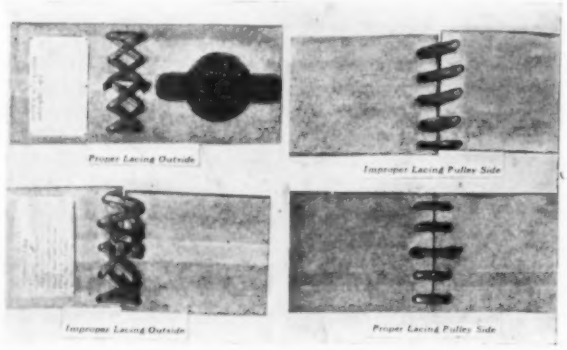
WOODEN BELT-STRETCHER

RUBBER BELTING

The rubber belt, on the other hand, has all the merits rightly attributed to the time-honored leather belt, practically none of the shortcomings, and many additional advantages. Like tires, footwear, and other rubber goods, the modern rubber belt is the result of remarkable evolution in manufacturing. The earlier belts had all the inherent faults of a product of an undeveloped industry and many of the later ones were better made but far too much was expected of them, and the disappointment of too confident buyers hurt the industry. Finally, through the confidence and enterprise of rubber manufacturers, and after a great deal of experimenting and rigorous testing, the practically perfect rubber belt of today was put on the market and soon found favor with progressive industrial managers in all parts of the world. To them it has become indispensable for a host of purposes.

WIDE FIELD OF USEFULNESS FOR RUBBER BELTING

The well-made rubber belt is remarkable for its long life. Instances are cited where main-drive belts of rubber have stood up under the hardest strain for twenty years before renewal was found necessary. The rubber belt is not readily affected by heat, cold, dryness, or moisture, and it can be constructed so as to be impervious to the action of acids, gases and steam. Hence it is preferred for mills, mines, cement works, sugar refineries, bleacheries, grain elevators, oil wells, concentrating plants, dredging machines, and for numerous other purposes where power has to be transmitted or materials conveyed, often under most adverse surroundings. So efficiently is the modern rubber conveyor belt made that it has largely replaced those of iron and steel for handling ores, coal, stone and other rough abrasive materials, and it can be used in situations where a metal conveyor would be impossible. Its latitude as to construction is practically limitless; in other words, it can be made to suit the most varied service conditions.



SINGLE ROW LACING

Presenting a very smooth surface to the pulley and being very pliable, the rubber belt obtains exceptional cling or adhesion, with correspondingly greater transmission of power. This saving in slippage, or greater friction, means a power saving in favor of rubber over leather belting of from 25 to 40 per cent. If a rubber belt slips it is usually due to overloading. Vibration in machinery is noticeably less, and wear consequently reduced, with rubber belting, as on account of its even surface, uniform strength

and thickness, and freedom from torsion and flapping, it carries machinery along steadily.

Other points in favor of the rubber belt are that it eliminates differences between the two sides of a belt in pulling quality. While leather belting gives a gradation of strength in three plies, single, double and triple, rubber-covered belting will afford a range varying from 3-ply to 8-ply, or, in the case of friction-surfaced belting, 3, 5, 7, 9, 11, 13, and 15-ply. Not the least important feature in favor of rubber belts is that they stretch less in service than those of other material and thus save much loss in the labor of tightening belts.

FIELD WORK IN APPLYING AND REPAIRING

The application or fastening of the ends of all belts, except those made endless, was a problem that vitally interested all belt makers. It was what is termed field work and any belt catalog gave specific directions as to methods of lacing and of replacing. Not only this, but manufacturers supplied the most tenacious cements; all because the life of the belt and its satisfactory work depended upon proper application. While thus teaching belt users to apply belts they were actually showing them how to repair them. It therefore happens that field work in belt repair is well advanced, although not as yet standardized.

The tools used are of the simplest sort: a belt punch for cutting the holes, cement can, hand sticker, brush and a belt-stretcher. The stretchers are to bring the ends of the belt together, and while there are a variety of kinds involving the use of rope winds, and toggles, those in general use are steel or wooden clamps through which two steel rods are run into heavy nuts. The take-up is effected simply by turning the threaded rods as far as may be necessary.

DOUBLE GRIP LACING

Efficient operation of a rubber belt is dependent much more upon proper fastening than many belt users realize. Proper fastening means getting the maximum amount of power transmission, conversion, or diversion for which a belt has been specially selected. It means a more steady drive and freedom from jerks, flapping, vibration, and side-sway, and it means for the belt less wear and longer life, economic factors of no small importance, especially where many or very expensive belts are used considerably. This anxiety may not give much concern to those who have their rubber belts, for high speeds or heavy drives, made endless or continuous at the factories from which they are bought and at which they are made up according to specifications.

But even the best rubber belts may stretch somewhat through long use or through working under adverse conditions; or it may be found desirable to shorten an original endless belt so as to work it on pulleys closer together. In that event the belting must be dealt with in just the same way as material bought in the roll and fitted to machinery by the purchaser. Not only must the utmost care be exercised with regard to fitting and measuring the belt, but also as to the mode selected and the materials chosen for fastening the ends of the belt together. It is a truism that a chain is no stronger than its weakest link, and so, also, is it a fact that a rubber belt in service is no stronger than its fastening.

THE LEATHER LACING

The oldest and, despite its slowness, still the most favored method of fastening belt ends together is that of leather lacing. While still done largely, and often successfully, by rule of thumb, the lacing of rubber belts can be and to a fair degree has been well-standardized. It is only by adhering to certain well-settled rules concerning the fastening of belts that real satisfaction can be assured. The quality and the cutting of the thongs used in lacing rubber belts are of primary importance. The United States Navy Department is exacting in this regard. Its specifications require that all thongs for lacing belts shall be cut only from green slaughterhouse hides. They must be cut lengthwise from the hides and must have in the various sizes a tensile strength per square inch of at least as much as that indicated in the following table:

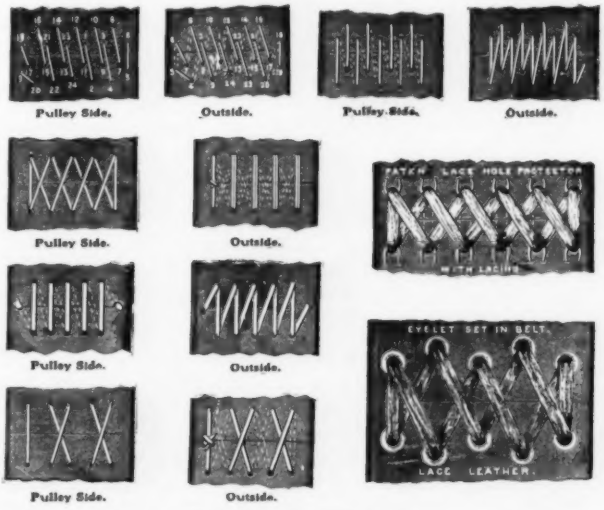
Width.....inches	1/4	5/16	3/8	7/16	1/2	5/8	3/4
Strength.....*pounds*	95	125	155	165	180	205	230

In the choosing of a lace heed should be given to the kind of drive, the diameter of the pulleys, the speed of the belt, the power transmitted, and the safety of workmen. As a general rule the lacing for a rubber belt is selected with regard to the width of the belt, the thinner kinds being used for the light, narrow belts, and the stouter for the broad, heavy belts. Lacing will vary in thickness from 1/64 to nearly 1/8 of an inch.

Proper lacing being provided, the first step in fastening a rubber belt is to square the butt ends perfectly. It is not safe to depend merely upon marking the ends with a pencil and then cutting. It is better to get a carpenter's square with which to outline the ends, and then cut accordingly. That will insure a true joint. If the ends of the belt are not cut perfectly, or if the tension put in the lacing is not uniform in both sides of the belt, the latter will have a tendency to run crooked and by striking cone edges, belt shifters, or other projections soon damage itself.

Having squared the belt ends, and finding that they line together perfectly, holes should be punched just large enough to allow the lacing thong to pass through them and distant in single-row lacing 3/4 to 1 inch from the ends of the belt, being careful to remove no more material from the belt than is really necessary in order to avoid weakening the belt. For the smaller belts a 1/4-inch lace will usually suffice; for belts from 4 to 8 inches wide, a 3/8-inch lace; for belts from 8 to 15 inches, a 1/2-inch lace; and for belts over 15 inches, a 3/4-inch lace. For unusually large, heavy belts a 1-inch lace is often used.

Before lacing it would be well to verify the measurement taken for the belt length by drawing a steel tape tightly around the pulleys to be used, and in order to allow for possible stretch to cut the belt a trifle shorter in about this proportion: For 3, 4, and 5-ply belts allow 5/32-inch per foot; for 6, 7, and 8-ply belts allow 1/8-inch per foot; for 9 and 10-ply belts allow 3/32-inch per foot.



OTHER WAYS OF LACING

BEST LACING METHOD

While single-row lacing may serve well in an emergency and even last long in some cases, the double-row or double-grip lacing

method is preferred by experts as being far more certain and durable. It is illustrated on the preceding page, and consists in punching two rows of holes in each belt-end, the second row to be the same distance from the first as that is from the end of the belt, so that each hole in the second row centers between the nearest two holes in the first row. The holes and lace size should be as shown in the following table:

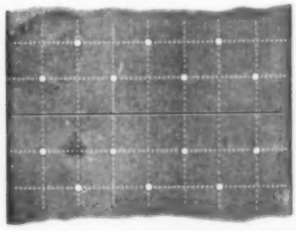
Width of Belts Up to	Size of Hole, Inch	Size of Lace, Inch	Distance of First Holes from Ends of Belt, Inches	Distance of First Hole from Edge of Belt, Inches	Space Between Holes, Inches
3 .....*inches*	5/32	1/8	1/2	3/4	3/4
3 to 6.....	3/16	3/16	3/4	3/8	1 to 1 1/4
6 to 12.....	1/4	3/8	1	1/2	1 1/4
12 to 18.....	5/16	1/2	1 1/4	1	1 3/4

Proportionate allowance should be made for larger belts.

The lace should be started in the center hole in the first row to the opposite hole in the second row and continued in such a way that the lace shall be straight and smooth on the pulley side, and crossed on the back of the belt. Having been begun in the center, the lacing should be looped through the holes first toward one edge, brought back to the center, crossed to the other edge, and then continued back to the center, finishing with both ends of the lacing in the same hole, but entering it from opposite sides of the belt. A hole is then made with a belt awl about 1/2-inch from the hole at which the lacing was started and finished, both ends of the lacing are tucked through this awl hole, pulled tight and cut off, leaving ends about 1/2-inch long.

SPACING HOLES FOR DOUBLE-GRIP LACING

The ends of the belt having been squared accurately, after the centers of the outer holes in the first row have been determined according to the aforementioned table, the intervening distance is divided into an even number of spaces made as nearly equal as possible to the distance that the outer holes in the row are from the edges of the belt, but taking care that the division length does not exceed this distance between the outer holes and the butt joint.



LAYING OUT LACE HOLES

Holes are then punched at every point in the first line, and at the intermediate points in the second row, the diameter of the holes being about three-fourths the width of the lacing.

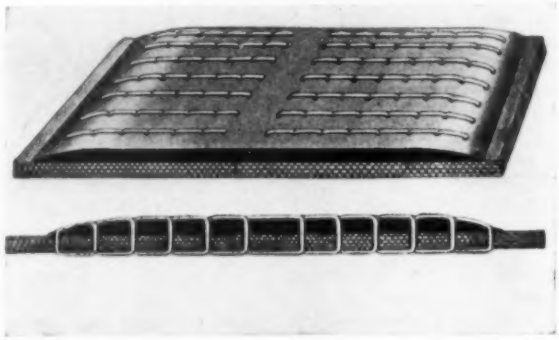
In making holes in rubber belts many good mechanics prefer to cut oval-shaped holes with double strokes of a round punch, but experts always use an oval punch, leaving the longer diameter of the oval parallel with the belt sides. A pointed awl is advised, instead of a punch, by some manufacturers.

HINGE JOINT LACING

Where leather lacing is used on small rubber belts running at high speed over small pulleys it is considered advisable to make the lace form a hinge. In this case the holes are punched in the staggered form used for the double-grip lacing already described, and the lacing is also started at the center; but instead of lacing straight, the leather strip is passed over and under, always lacing toward the outside.

LACING AND LAP FASTENING

Many users of belts 12 inches wide or over have found the following lacing and lapping method very satisfactory. Up to and including 12-inch belts, the latter are cut with 12 inches to spare, but beyond that size the excess is the same in inches as the belt is wide. If the belt is 4-ply, take off two plies on one end back 12 inches or more, according to the width as here illustrated. Then take the same amount off the other end, in such a way that the two prepared ends lap squarely together. The illustration shows the lap made as directed and the holes punched for lacing. If the belt has three plies, two plies should be taken off one end and one ply off the other; for 5-ply, three and two plies, respectively; for 6-ply belts, three plies off each end, and so on, all being punched as shown in the illustration.



THE BACK SPLICE

Light lacing is used for all 3-ply belts, and proportionately thicker lacing for the heavier and wider belts. The holes punched should be the smallest possible to admit the passage of the lacing. No cement is necessary if directions are closely followed.

MAKING A BACK SPLICE

On wide belts run at high speed, or where there is great strain and it is not convenient or desirable to use a cemented or riveted lap splice, a back splice will add much to the life, safety, and efficiency of a butt-jointed belt, although it is not suitable for belts running under an idler.

In making a back splice the butt ends of the belt are brought tightly together and a piece of belting put over the united ends as a reinforcement. This piece is usually equal in length to the width of the belt, but in some cases it may be made as short as half the width or as broad as one and one-half the width. The ends of this reinforcing piece should be skived to a feather edge, otherwise the splice will bump in passing around pulleys. It is fastened with leather lacing or rivets.

FIG 1.

FIG. 2.

FIG. 3.

LACE AND LAP FASTENING

LAP-SPLICING

When it is not convenient to get an endless belt from a manufacturer, a very satisfactory lap splice may be made by a careful mechanic that will be serviceable on belts of all sizes and particularly on those of much breadth. The ends having been cut absolutely square, the splice is made by "stepping" the ends of the belt for a distance equal to or greater than the width of the belt, being careful not to cut a lower ply while cutting for the one above. Hence a 4-ply belt should have four "steps," a 6-ply, six "steps," etc. The measurements of the steps should be equal.

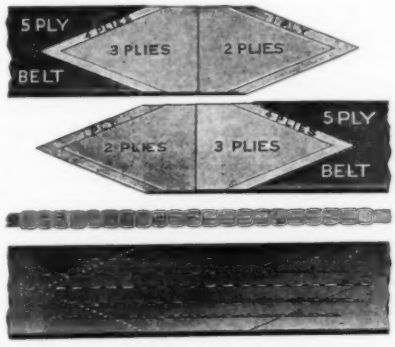
The scarfed surfaces are then given at least three coats of good rubber cement, allowing each to stand about an hour before joining the belt ends. The "stepped" ends are then carefully fitted together, clamped tightly, and allowed to dry for an hour or two. When dry the splice may be finished with fine leather lacing or machine stitching. Some use copper rivets placed 1½ inches apart.

THE LAP SPLICE

Some recommend a jacket of rubber-covered duck for protecting the lacing, the space inside the lacing being filled with pieces of duck and the whole covered with a large piece, all secured with rubber cement and dried under pressure. This protection is especially urged when fine lacing in small holes is used. If the jacket is provided, it need be placed only on the driving face of the belt, unless a tightener is used, in which case both faces should be similarly jacketed. The strips and cover should be thoroughly rolled or pounded onto the belt.

DIAMOND LAP SPLICE

Another method of making a lap splice is known as the diamond lap splice. It is made in a manner similar to the ordinary lap splice, except that the ends are cut pointed, instead of square, with right angle and diagonal lines, as shown in the illustration. The edges of the plies should be scarfed to insure a close fit.



DIAMOND SPLICE

The length of a diamond splice should be: for a belt 6 to 9 inches, inclusive, 24 inches; 10 to 15 inches, 30; 16 to 24 inches, 36; 26 to 32 inches, 42; and 34 to 48 inches, 48. This length is figured from the extreme points at either side, and takes in the square in the center and the triangular spaces at either end of the splice. Lap splices are advised for belts 16 inches or more in width.

AN EXPLOSION OF HARD RUBBER DUST[1]

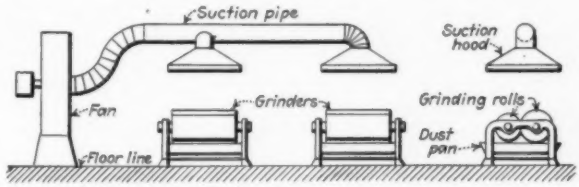
THE results of investigation of a recent explosion in the hard rubber scrap grinding department of a large industrial plant are given in a report by David J. Price[2] and Hylton R. Brown[3] of the Bureau of Chemistry, United States Department of Agriculture. The salient points of this investigation are here abstracted from the report.

REDUCTION OF HARD RUBBER SCRAP

The rubber scrap is first broken up into pieces about the size of a pea. In some cases this material is heated in large tanks. It is then ground between steam-heated rolls or in one of the various types of pulverizers. Sifters are used to separate any coarse particles from the rubber dust, and this coarse material is returned to the grinders. During this process large quantities of very fine dust are produced which tests have shown will explode violently under favorable conditions. Considerable sulphur dioxide gas is frequently produced during rubber grinding and in many cases no provision is made to remove this gas from the building. In such cases the atmosphere of the grinding department becomes a bluish color while grinding is being done.

EQUIPMENT ARRANGEMENT

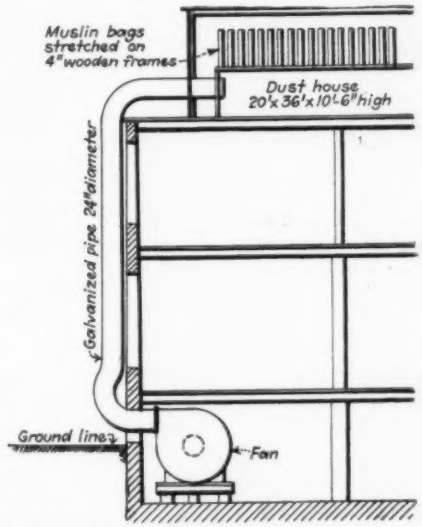
In the plant where this explosion occurred the grinding department was located in the basement of a two-story brick building. The space allotted to this work was about 60 by 120 feet. The basement was about ten feet deep but only six feet was below the ground level. Windows were provided above the ground line



Chemical & Metallurgical Engineering.

SIDE AND END VIEWS OF GRINDERS AND HOODS

for light and ventilation. Various types of grinding machines were installed with the motors necessary to operate them. These motors were of different makes, but were all of the squirrel-cage induction type. All switches were of oil-immersion type and the fuses were of the non-arcing type inclosed in covered steel boxes. The electric lights were of the drop-cord type of installation and were not provided with vapor-proof globes or guards. A suction system was provided to remove the dust from the building. The dust was drawn into hoods located over the grinding machines and then into the fan, whence it was blown through a 24-inch galvanized pipe into a dust-house located on the roof of the building. This pipe ran up the outside of the building and had two right-angle turns, one where the pipe came out of the basement window, and the other where it turned to enter the dust-house on the roof. The dust-house, which was of frame construction with corrugated metal sheathing, consisted simply of an expansion chamber with a number of muslin bags stretched on wooden frames through which the air escaped, while the dust fell to the floor of the dust-house. The dust produced during the grinding was so fine that a large quantity was drawn into the collecting system, and this made it necessary to clean the dust-house frequently.



Chemical & Metallurgical Engineering.

DUST-COLLECTING SYSTEM

EXTENT OF EXPLOSION

The explosion, which the evidence indicates originated in the basement, occurred about 4:35 a. m. The first explosion was

[1] Chemical and Metallurgical Engineering, April 27, 1921, page 737.
[2] Engineer in charge development work, Bureau of Chemistry.
[3] Assistant in grain dust explosion prevention.

quickly followed by a second and some families living near the plant report hearing three distinct explosions. The explosion evidently propagated to the first floor of the building, where the windows, doors and one corner of the brick wall were blown out. It also propagated through the suction system to the dust-house, which was completely demolished.

ORIGIN OF EXPLOSION

The fact that so much damage was done to the fan and exhaust-pipe would indicate that the explosion had built up considerable force by the time it reached this point in the system. It is believed that the explosion originated in or near one of the grinding machines and was caused by foreign material entering the grinder, by a broken electric light, or by a lighted match. The flames propagated throughout the basement, where the employes were severely burned, and extended to the first floor. The flames entering the suction hoods flashed through the suction pipe to the fan, where they met their first obstruction and built up the pressure which blew out the weakest side of the casing, the one containing the inlet opening. The flames also propagated through the fan into the exhaust pipe, built up sufficient pressure at each bend to rupture the pipe and continued into the dust-house on the roof of the building, where enough dust was present, estimated at about 125 pounds, to cause an explosion which completely wrecked the house. It must be remembered that this is only a theory of what happened during the explosion, built on the knowledge obtained during the investigations of previous explosions in industries where the conditions and some of the installations were similar to those in the hard-rubber grinding industry.

RECOMMENDED PRECAUTIONS IN HARD RUBBER GRINDING

1. The grinding department should be segregated from the remainder of the plant and, if possible, operated independently of other units.

2. The building containing the grinding department should be of heavy framework with light walls and roof so as readily to permit the release of pressure from the building should an explosion occur.

3. Good ventilation should be provided and where gases heavier than air are produced during the process, the air should be drawn out of the room near the floor and fresh air admitted near the ceiling.

4. Where fine dust is produced an efficient dust-collecting system should be installed. The old-style dust-room, where large clouds of dust are in suspension, should be eliminated. The dust should be collected as near as possible to the point of origin and conveyed through pipes with fewest bends to the collector, which should be located outside of the building or vented to the outside air. If sharp turns are necessary in the pipe line inside the building, place a vent at the bend, leading to the outside air with a cap which will be blown off should any high pressure occur at this point. Drawing explosive dusts through a fan should be avoided where possible. A suction through the collector or an induced air current is preferable.

5. Special precautions must be taken to prevent metal entering the grinding machines. This is the only way to guard against ignition of dust by sparks struck in the machines. A vent from the machine to the outer air often assists in preventing a disastrous explosion by providing a direct means of escape for the primary explosion within the machine.

6. Where clouds of explosive dust are produced, electric lights should be inclosed in vapor-proof globes and be properly guarded to prevent accidental breakage. All switches and fuses or electrical equipment in which sparks might be produced should be located in a separate room or at least inclosed in fire-proof and dust-proof boxes.

7. Rules against smoking and carrying matches, where conditions are favorable for a dust explosion, must be rigidly enforced and special attention be given to prevention of hot-boxes on machinery operating in dusty atmospheres.

8. Cleanliness is the best general precaution to adopt for the prevention of dust explosions. A disastrous dust explosion cannot occur in a clean plant, because the flames cannot propagate unless dust is present to be mixed with the air in sufficient quantity. From 0.02 to 0.04-ounce of dust per cubic foot of air is usually sufficient to form an explosive mixture. The plant should be kept scrupulously clean, especially overhead structures where dust accumulations could be thrown into suspension in the air by a sudden jar or shock.

The Determining Factors for the Life of a Pneumatic Tire[1]

By William G. Nelson[2]

THERE are five very important and very decisive factors for determining the life of a pneumatic tire. Each has a direct bearing upon the other, and a weakness in any one will prove a death blow to the ultimate mileage which a tire is supposed to give. These five factors are: rubber and compounding materials, fabric, construction, vulcanization and usage.

RUBBER AND COMPOUNDING MATERIALS

The rubber and compounding materials are comprised of rubber, fillers, softeners, accelerators and vulcanizing agents. A mixture of rubber, sulphur and other materials is called a compound. There are various kinds of compounds used in a tire, as tread, carcass friction and skim coat, breaker friction and skim coat, and side-wall. The tread must have good wearing qualities, good appearance, and coordination with the carcass. By this last phrase is meant the ability to properly adhere to the remainder of the tire. Good wearing qualities are obtained by properly compounding suitable materials and curing agents with high-grade wild or plantation rubber. The most finely divided fillers, such as zinc oxide, gas and lamp black and similar mineral fillers, are extensively used, due to their microscopical fineness, which gives high tensile strength, good stretch, and resistance to abrasion, cutting and aging. Friction and skim-coat stocks are so compounded as to give good adhesion to the fabric and a cushioning effect between the plies of fabric. These stocks are composed almost entirely of rubber, softeners, sulphur and accelerators. The vulcanizing agent which is sulphur, and the accelerators, excepting the rubber, are the most important parts of a compound. An accelerator is a material which accelerates the chemical combination of the sulphur with the rubber. Since the action of accelerators is so erratic in mixing, calendering, and vulcanizing, only experienced men should undertake the handling of these agents. The side-wall must have good appearance, as it holds one of the most conspicuous places on the tire. It is used for the protection of the fabric against chafing and moisture. Since it is continually exposed to atmospheric conditions it must have good aging qualities rather than high tensile strength or long stretch.

All compounds that come in contact with each other must have good adhesion after vulcanization. The factors that bear upon this condition are: type of rubbers selected; kind and amount of fillers, sulphur, and accelerators; mixing and calendering of the compound; building of the tire; and finally the degree of vulcanization.

[1]Paper read at the meeting of the American Institute of Chemical Engineers, Detroit, Michigan, June 20-23, 1921.

[2]Chief chemist, Morgan & Wright, Detroit, Michigan.

FABRIC

Fabric is the foundation upon which the tire is built. It is used to give stability and strength. There are two well-known classes of tires, the square-woven fabric and the cord fabric. In the square-woven fabric tire the threads in each ply run in both directions, alternating over and under as in a piece of ordinary cloth. In the cord fabric tire the threads or cords in each ply run parallel with the exception of a few small cross threads used simply to hold the cords in place while they are being impregnated with the rubber compound. The life of a tire would be greatly increased if internal friction could be eliminated. The internal friction caused by intermittent distortion of the tire in use is the result of the friction of the threads upon each other and the strains and stresses set up in the rubber compound. Naturally the fabric which gives the least amount of internal friction will give the longest life to the tire.

Since square-woven fabric cannot be thoroughly impregnated with rubber compound, the places where threads cross will be left bare and at these points flexing will cause a sawing action and the generating of frictional heat. It has been demonstrated very clearly by experiment that, when the temperature resulting from mechanical action reaches 230 degrees F., vulcanized rubber ceases to function as an adhesive compound, and crumbles into minute particles which fail to resume their original condition, causing the compound to lose its function in the tire. This causes separation, weakness, and finally a blow-out. It may be interesting to know that 265 degrees F. is not an uncommon temperature reached in a tire when driven at high speed over the road; this is particularly true of large truck tires.

In the case of cord fabric each thread is embedded in the rubber compound and the internal friction is reduced to a minimum. The ideal condition would be to have each cotton fiber of thread embedded in rubber but of course this is not practical and on account of weaving difficulties this has not been accomplished. Since cord fabric comes closer to the ideal condition, the time is not far distant when it will entirely supplant square-woven fabric in the carcass of the tire. A step in this direction will be made when the cost of producing cord tires is sufficiently reduced to successfully compete with the square-woven tire. A brief summary of the advantages derived from the use of cord tires would include easier riding, due to greater resiliency; saving of gasoline and oil; saving of machinery and more miles per dollar.

Fabric is also used in the breaker and chafing strips. The breaker fabric is covered with a rubber compound that will act as a binder between the soft cushion stock and the stiff tread stock. The breaker fabric is used to give this compound stability and therefore decreases the separation between the tread compound and the cushion. The chafing strips are used for protection and reinforcement.

At this point something should be said about the mixing of the rubber and ingredients, and the calendering or application of the compound to the fabric. There are so many factors that enter into the mixing that they can be only briefly described here. Breaking down of the rubber by mechanical action changes it from a tough, hard state to a tacky, plastic condition. This influences the impregnation of the fabric, tackiness, blooming and other physical qualities, and also the vulcanization. The thoroughness of incorporation of the compounding elements has an influence upon uniform vulcanization and wearing conditions. In order to eliminate to the highest degree the variable conditions inherent to milling, calendering, building operations and vulcanizing, it is necessary to have every process standardized and a rigid inspection to hold to a minimum the factor of the human element. Therefore all reputable manufacturers analyze thoroughly all compounding materials and rigidly inspect all fabric before these elements enter into the tire, and also carefully control the degree of vulcanization in the finished product.

TIRE CONSTRUCTION

Tire construction is an art in itself. It is like the building of a machine, and just as much care must be used in designing a tire as is used in designing a finely adjusted machine. As nearly every tire is built on an iron core and vulcanized in a mold, the space occupied by the tire is constant and is filled with a unit composed of many variables. Therefore, when the fabric is frictioned and skim-coated it is held to a gage of a maximum or minimum variation of two or three thousandths of an inch. Likewise all other parts, as top cushion, breaker, tread, bead and side-wall, are held to a maximum or minimum gage. The proportion of the fabric to the rubber compound must be properly balanced. The addition of an extra ply or the increase of the thickness of rubber compound may destroy this balance and materially weaken instead of strengthen the tire. It has been demonstrated many times by actual service tests that the correct distribution of rubber compound in the tire will increase its life several thousand miles; or the changing of the sulphur one-half of 1 per cent in a single compound will cause an equal variation in the mileage. There are many faults in a finished tire that may be attributed to improper construction, as wide overflow, wrinkling of breaker and plies, incompletely filled molds, and weakness in the beads. These are usually remedied by changing the construction but in some instances the proper results can be obtained by changing the compound, the process of vulcanizing, or redesigning the equipment.

VULCANIZATION

There is probably no phase of tire manufacture that receives more attention than the vulcanization of the tire and still there is no phase that is more problematical. The proper degree of vulcanization is an empirical condition existing in the various components of a tire which is determined by results obtained by road tests. Either an undervulcanized or an overvulcanized tire will give low mileage; even if a single part, such as cushion, breaker, or tread compound, is over or undervulcanized, the entire shoe will give poor results.

The controlling factors in a compound to obtain this empirical state are the sulphur, accelerators, rubbers, milling and calendering, time and temperature of the cure. Any one of these conditions will materially affect the state of vulcanization. The proper manipulation of these variables is a chemist's job and requires great care, thought and experience. It is absolutely essential for the chemist to have a laboratory fully equipped to make comparative physical and chemical analyses, to develop new compounds, and try out new compounding ingredients. Various types of rubbers made by different methods of coagulating, washing and drying have different vulcanizing ranges and optimum cures, that is, the state of maximum efficiency when vulcanized, therefore great care must be exercised in their selection for a compound. Furthermore, the optimum cures of all compounds must be so adjusted that in the finished product every component of the tire has simultaneously reached its maximum efficiency. Excessive milling causes the compound to vulcanize more slowly but more uniformly; decreases the tensile strength, and increases the stretch. These actions can be explained by the breaking down of the rubber molecule into its polymeric stages, each stage having its own particular range and optimum cure with its corresponding tensile and stretch. The slower a compound is vulcanized to its optimum cure, the better resistance to aging it will have; therefore low vulcanizing temperature and long time is preferable for quality of product, but owing to the demands of quantity production, higher temperatures and shorter times are resorted to. The scientific explanation of the effect of time, temperature and mechanical action upon quality of product is a problem for research and it is high time that some of these problems were given proper investigation by the scientific men of today.

USAGE

If the tire is neglected and abused while in service, all the care used in testing and selecting the rubbers and the compounding

materials, analyzing the fabrics, standardizing the operations, and maintaining an experienced organization in order to make the most uniform and perfect product will be of no avail. A pneumatic tire is designed and built to contain air, or an inert gas, under pressure, and there are no recommendable substitutes for it on the market today. The greatest danger that befalls a tire in service is underinflation. Proper inflation is to the life of a pneumatic tire what proper food is to the life of a living being. Eighty per cent of the failures in tires can be traced to underinflation. Briefly the results of underinflation are early separation in all parts of the tire, rim cutting, abnormal development of frictional heat, greater power and fuel consumption, rupturing of the fabric, splitting of tread, and abnormal strain throughout the tire.

The Society of Automotive Engineers and the Tire and Rim Association, and all the large manufacturers of tires have agreed upon standard pressures to be used in tires and these pressures should be adhered to religiously in order to obtain the highest mileage. Overloading is another abuse that is often imposed upon a tire which causes an early breakdown of the carcass and finally a blow out. Other causes for premature failures are: improperly fitting rims, which cause rim cutting, thus exposing the fabric to moisture and chafing; misalinement of wheels, which causes excessive tread abrasion; running over curbs, deep ruts, stones, nails and glass which causes breaks and cuts in the tread and carcass; sudden braking which causes tread abrasion and separation; turning corners at high speed which causes excessive strains on the fabric and later a rupture; overheating which causes separation; and sun exposure which causes checking.

The ultimate desire of every motorist is to obtain the most miles per dollar per tire with the advantages of riding on a cushion of air, and the only way for him to obtain his desire and retain these advantages is to use common sense in the use and care of the pneumatic tire.

INTERESTING LETTERS FROM OUR READERS

DYES IN TOY BALLOONS NOT POISONOUS

RECENTLY *The New York Herald* printed the following statement attributed to the New York State Health Department: "Some of the dyes used in coloring toy balloons are capable of causing a severe inflammation when brought in contact with the skin while in a moist condition."

In refutation of the threat against the toy balloon industry implied by this misleading statement, the following conclusive letter from a well-known authority is published.

TO THE EDITOR:

DEAR SIR: Replying to your favor of July 5, we have no objection whatever to your publishing our name in refutation of the statement that the dyes used in the manufacture of toy balloons are dangerous to children.

The strange part about this is that it is partly true and half the truth sometimes is worse than a direct untruth. If children ate the dyes used in toy balloons, there probably would be some ill effects, but the percentage of dye used in toy balloons is probably less than 1/10th of 1 per cent, and furthermore, these dyes are entirely insoluble either in saliva or aqueous solutions, because they are either resinates or oleates of aniline colors, and it is utterly impossible to imagine how a child sucking the toy balloons could absorb enough to do even the slightest damage.

We would like to find out who originally sent out this report, and what evidence a man had to entitle him to make this statement.

New York, N. Y. TOCH BROTHERS.

DANGER FROM TOY GAS-BALLOONS NEGLIGIBLE

The New York Sun prints a statement from the chief inspector of the New York Bureau of Combustibles that toy balloons filled with hydrogen gas were dangerous in the hands of children, and the sale should be prohibited. That this agitation against the use of toy balloons is not justified by facts is clearly explained in the following letter from a competent authority.

TO THE EDITOR:

DEAR SIR: Replying to your letter of July 13, it is quite evident that the Bureau of Combustibles of New York City is emulating the example set by the London County Council, of London, England, which early in the year legislated against the use of toy balloons filled with hydrogen gas on the grounds of fire hazard, and the possibility of injury resulting if the gas should explode.

We feel, and so, indirectly, said to the London County Council, that the danger from these causes was really negligible for the reason that toy balloons do not hold enough hydrogen gas to start a conflagration, or to injure people, except under very unusual circumstances. We have known of cases where toy balloons inflated with hydrogen gas were either purposely or carelessly exploded by means of cigarettes or matches, but have never known of any serious accident or damage resulting from such misuse of the balloons.

Furthermore, until within the past year or two when the manner of inflating toy balloons with hydrogen gas was greatly simplified by the introduction of hydrogen gas cylinders, the percentage of balloons inflated with hydrogen gas was very small as compared to the quantity made and sold.

A concerted effort is now being made by London interests to have the London County Council annul this arbitrary ruling, and in our judgment the agitation which is being started in this country against toy gas balloons is really unjustified by facts. If put into effect, such rulings will be the cause of depriving kiddies of a most entertaining form of amusement.

New York, N. Y. MANUFACTURER.

REGARDING SAPONIFYING AGENTS FOR WAXES

TO THE EDITOR:

DEAR SIR: In THE INDIA RUBBER WORLD, May 1, 1921, Dr. Dannerth mentions the saponification of waxes, such as carnauba, candelilla, beeswax, etc., that are converted into soaps by boiling with alcoholic potash.

If it is not practical to use alcoholic potash, or ordinary potash to saponify these waxes, could monohydrate of soda be used with as good results? What properties does potash contain that are different from strong soda, such as monohydrate? Is there any difference in the action of the two alkalies on wax, provided enough is used of each kind to make a saponification?

Philadelphia, Pennsylvania. INQUIRER.

In the experimental work of the chemical laboratory, alcoholic potash is generally used for saponifying oils, fats and waxes because experience has shown that the saponification proceeds more readily when that agent is employed. Then too, the soap obtained as a result of the potash saponification is a soft soap and is therefore more desirable for laboratory manipulation.

In the practical work of the factory, caustic soda or sodium hydrate, as it is sometimes called, is found to saponify in a satisfactory way. The product is, of course, a hard soap. Commercial oleic acid saponified with caustic soda will yield a common brown soap, which dissolves in water with relative ease. The soap prepared from stearic acid and caustic soda is, however, much more difficultly soluble in water. For that reason the soap maker generally uses a mixture of the two acids when making commercial soaps. It will be found that soaps in general are soluble in 90 per cent denatured alcohol.—FREDERIC DANNERTH.

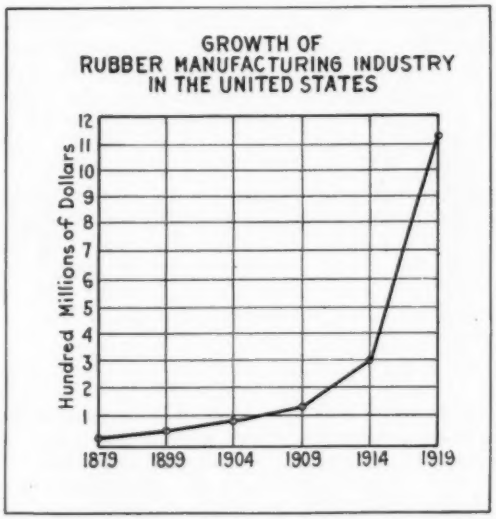
THE OHIO RUBBER CO., CINCINNATI, OHIO, IS MARKETING "Howard's Ideal" bathing garters, on which it has applied for a patent. At one end of a straight strip of inch-wide rubber is inserted a double-headed bone button. Perforations about ¾-inch apart in the other end stretch over this button to fasten the garter and at the same time make it adjustable.

An Analysis of the Preliminary Summary of the Manufactures of Rubber Goods

From Report of the Bureau of the Census, Department of Commerce, 1914-1919

By Richard Hoadley Tingley

PRIOR to 1899 rubber manufacturing as an industry had not found itself. In the twenty years previous to that time its advance had been slow, gradually increasing in value from $25,000,000 in 1879 to about double that figure in 1899. But the twenty years that have since elapsed have seen the manufacture



of rubber goods emerge from a comparatively insignificant industry of less than $50,000,000 a year to figures well above the billion-dollar mark, an increase of something like 278 per cent. Most of this advance came about between 1914 and 1919, when the total value of all the products of rubber manufacture in the United States increased nearly four-fold, the two items of automobile tire casings and inner tubes amounting, in the latter year, to more than double the value of the entire rubber manufactured product in the former.

Official figures of values and percentages of increase have been tabulated as follows:

GROWTH OF THE RUBBER MANUFACTURING INDUSTRY

	Value	Total Increase Per Cent	Yearly Increase Per Cent
1879	$25,310,000	....	....
1899	49,212,000	94.4	9.4
1904	80,848,000	64.3	12.8
1909	126,404,000	56.4	11.3
1914	300,994,000*	138.2	27.6
1919	1,138,216,000*	278.1	55.6

*Establishments assigned to other classifications report, in addition, products valued at $7,574,000 in 1919, and in 1914, products valued at $752,503.

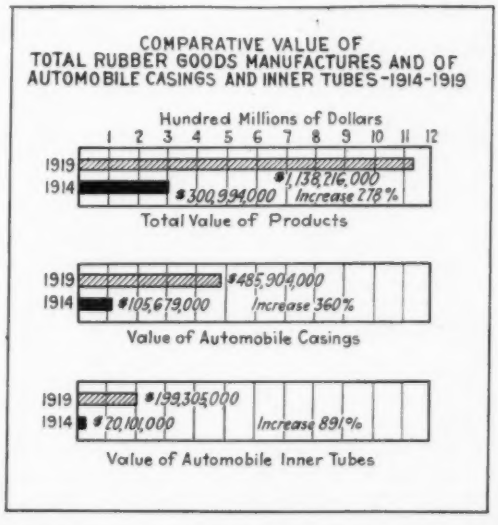
The Bureau of the Census has recently published a preliminary statement of the results of its 1920 canvass of the rubber manufacturing industry, which includes information received from 475 plants for the year that ended December 31, 1919, as compared with that reported by 342 establishments in 1914. The final report will probably not be available for several months to come and the Bureau states that its preliminary figures are subject to change and correction as may become necessary upon further examination of the original reports. Those who have followed previous comparisons of this kind, however, will realize that no marked amendment of present figures may be looked for.

Although THE INDIA RUBBER WORLD published last month some of the tabulated comparative results contained in the preliminary report, a further analysis of the subject matter will not be out of place in order to bring out the relative values, and increase in values, of the different classes of rubber manufactures, which can best be illustrated graphically.

The greatest contrast, as well as the largest totals, are seen in the figures bearing on the tire industry, where the number of casings for automobile tires increased from 8,022,000 in 1914 to 22,727,000 in 1919, and the value of these products increased from $105,679,000 to $485,904,000 in the same period, an advance of 360 per cent. During these five years, also, the number of inner tubes for automobile tire casings increased from 7,908,000 to 39,700,000, and their value from $20,101,000 to $199,305,000, the per cent of increase being 891.

In 1919 there were manufactured 3,422,000 casings and 1,393,000 inner tubes for motorcycles and bicycles, representing a value of $11,892,000 and $2,904,000, respectively, the total value of these two items being $14,796,000. In the census report for 1914 these amounts and values are not separated. Combined, however, the total of the two is 3,728,000 in number, and $6,906,000 in value. The value of the two items taken as a whole represents an increase of $7,890,000 between the years under review, or 114 per cent.

There were 8,255,000 solid tires of all kinds made in 1919, of a total value of $52,992,000. This compares with a value of $13,736,000 in 1914, an increase of 285 per cent. This advance is due in a very large measure to the increase in the use of the motor truck in commercial work of all kinds, including not only



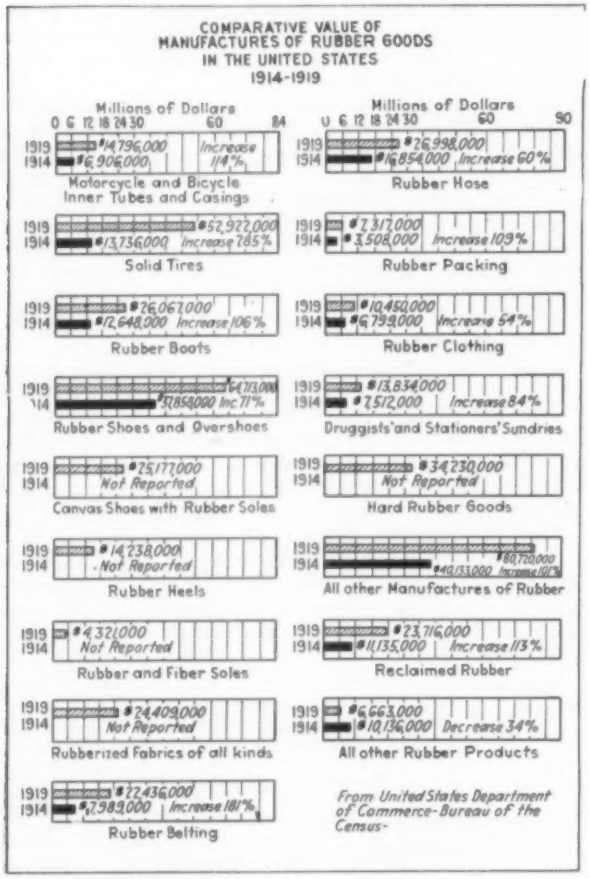
short, but comparatively long hauls. The rapid increase in the use of motor trucks in freight haulage became apparent in the early part of last year. The slump of a year ago caused a halt in this comparatively new industry—as it did in all industries. There are many, however, who expect to see a much greater

advance in the general use of trucks within the next few years than has already taken place. "Truckportation" has, apparently, come to stay.

Next to the increase in the manufacture of automobile and truck tires comes that of rubber belting, a 181 per cent advance, from a value of $7,989,000 in 1914, to $22,436,000 in 1919. Rubber belting is closely followed by rubber packing, with an increase of 109 per cent, from a value of $3,508,000 to $7,317,000.

Rubber hose manufactures rose from $16,854,000 to $26,998,000. a total advance of 60 per cent for the period.

The manufacture of rubber boots has shown a healthy growth from 4,025,000 pairs to 9,208,000 pairs, and from a value of $12,648,000 in 1914 to $26,067,000 in 1919, an increase of 106



per cent. In rubber shoes and overshoes the advance has not been so rapid, although the volume of business in these commodities is far ahead of that of rubber boots in both of the years compared. The increase has been from 57,212,000 to 66,195,000 pairs, and from $37,858,000 to $64,713,000, or 71 per cent increase in value.

The volume of the country's business in druggists' and stationers' supplies has increased 84 per cent, from $7,512,000 to $13,834,000.

There were $10,450,000 worth of rubber clothing manufactured in 1919, as against $6,799,000 in 1914, the increase being 54 per cent. Of rubberized fabrics for automobiles and carriages, 14,429,000 yards were made in 1919, valued at $10,697,000 Rubberized fabrics for all other uses amounted to 17,630,000 yards, and in value to $13,712,000. The total of these two items amounts in yards to 32,059,000, and in value to $24,409,000. The 1914 report is silent on both yardage and value and a comparison of the growth of this branch of the industry cannot be made.

The manufactures of canvas shoes with rubber soles amounted to 19,896,000 pairs in 1919, valued at $25,177,000, although no 1914 comparisons can be made. The same may be said of rubber heels and fiber soles, the former aggregating a business of 126,572,000 pairs valued at $14,238,000 in 1919, the latter of 18,437,000 pairs, valued at $4,321,000. The fact that no report for 1914 is available is not to be wondered at, because these "human shock absorbers" had hardly found a place in the market as far back as that time.

The reclaimed rubber industry, which includes rubber produced and sold as such, or on hand, is also increasing rapidly—113 per cent in the past five years, from $11,135,000 to $23,716,000.

Strange as it may appear, also, the census report gives no figures for 1914 on the manufactures of hard rubber goods, although the 1919 volume of business amounted to $34,230,000.

Classified under "all manufactures of rubber" the report lists a total business in 1914 of $40,133,000, against $80,720,000 in 1919, an advance of 101 per cent. Under the caption of "all other rubber products," the report notes a decrease in volume of 1919 business when it states that this item amounted to $10,136,000 in 1914 and to $6,663,000 in 1919, a decline of 34 per cent. It is more than possible, however, that this decline may be accounted for by differences in classification in the two years.

The preliminary census report does not contain information regarding the number of plants engaged in the manufacture of this or that product, nor of the number of employes in the various branches of the industry. Other statistical information is also lacking which is contained in the final report for 1914. These data will doubtless be forthcoming in the final 1919 report that will follow.

The preliminary report does, however, give the geographical distribution of the 475 plants in operation in 1919 among the states, which shows that Ohio, with 96 establishments, is the leading rubber manufacturing state in the Union. New Jersey comes next with 73 factories, followed by Massachusetts with 56. Then follows New York with 43 and Pennsylvania with 32. Connecticut, California and Illinois come into line with 26, 22 and 21 plants, respectively. Indiana has 16 and Rhode Island 10. Iowa and Wisconsin each operate 9 factories. In Missouri and Oklahoma there are 8 plants in each state. Michigan has 7 and Texas 6. In Colorado and Washington there are 4 each. In each of the states of Georgia, Kansas, Minnesota and Nebraska there are 3. Maryland, North Carolina, Oregon, West Virginia and Delaware each have 2 rubber factories, and in Kentucky, Louisiana and Maine there is a single factory in each state.

RUBBER FINGERS IN ORANGE WASHING

Rubber plays a new rôle in connection with machines used for washing oranges by means of a series of revolving brushes operating under running water. Vertical elevators which carry the oranges to the washers have a series of curved, iron fingers which, while they served their purpose very well, nevertheless occasioned a large percentage of loss by bruising the fruit.

A rubber manufacturer recently came to the relief of the orange packers with rubber tips like finger cots for the conveyor prongs, and now the fruit passes to the washing machine undamaged; and, it is stated, the cost of washing has been lessened and the work expedited.

GOVERNMENT ROADS BUILT IN THE PHILIPPINES HAVE AFFORDED a good opportunity for the sale of automobiles and tires in these islands, according to Harris Waite, Goodyear salesman, who returned recently after a two years' stay in the Philippines. Several truck fleets are being used by the planters and the automobile is growing in popularity throughout the islands, for both business and pleasure.

Dynamic Balance and Construction of the Pneumatic Tire[1]

By William Roberts[2]

IT has always been a puzzling problem to secure perfect running balance of an automobile pneumatic tire. To combine long life of bearings and accuracy of operation in any machine where the speed of rotation is great, the revolving parts must be in perfect balance. Lack of running balance produces not only

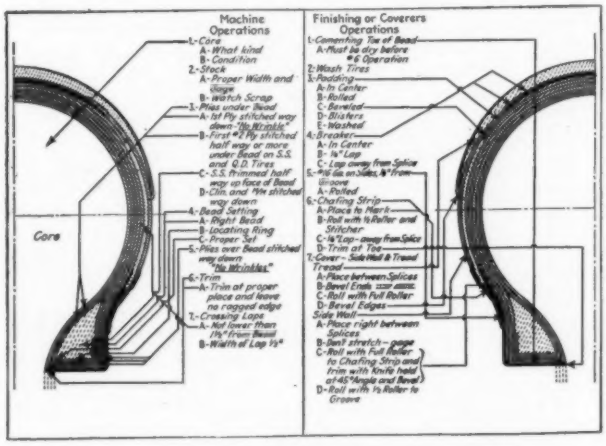


FIG. 1. STRAIGHT-SIDE TIRE CONSTRUCTION—MACHINE AND HAND OPERATIONS

a vibration of the unbalanced parts but of the whole machine. For instance, if a tire is not balanced it will wear unevenly and therefore reduce the mileage.

MILEAGE OF TIRE REVOLUTIONS

The following table will show the various tire sizes with the number of revolutions per mile and 3,500 miles.

Size, Inches	Circumference in Inches	Revolutions Per Mile	Revolutions Per 3,500 Miles
26	81.7140	775.38	2,713,830
28	88.	720.	2,520,000
30	94.2856	672.	2,352,000
31	97.4284	650.32	2,276,120
32	100.5712	630.	2,205,000
33	103.7140	610.91	2,138,185
34	106.8568	592.94	2,075,290
35	110.	576.	2,016,000
36	113.1428	560.	1,960,000
37	116.2856	544.86	1,907,000
38	119.4284	530.52	1,856,820
39	122.5712	516.92	1,809,220
40	125.7140	504.79	1,766,765
41	128.8568	491.70	1,720,950
42	132.	480.	1,680,000
43	135.1428	468.84	1,640,940

THE EFFECT OF UNBALANCED TIRES

At every revolution, when the heavy side of the tire comes in contact with the road, it receives more wear besides transmitting vibration to the running motor. If the fly-wheel or crank of an automobile engine is badly "out of true" the whole car will shake. Not only are vibrations unpleasant, but they are very destructive to the engine, the bearings, the chassis and the joints. Sometimes a tire delivers a mileage of 15,000 miles and to all appearances is in good condition except that the breaker strip is beginning to show. That tire has through some mishap, or just plain luck, been in perfect running balance.

Some tire manufacturers have tried to balance tires by drilling holes in the bead and filling them with lead, but this has not proved successful for two reasons. (1) When the inner tube is inserted, the weight of the valve stem throws it out again. (2) It weakens the strength of the bead and eventually the tire.

Running balance is a subject of constantly growing importance. Exact symmetry of form is no guaranty of running balance.

VARIABLES IN TIRE CONSTRUCTION

From an engineering standpoint an endeavor will be made to show where some variables in the construction of a tire might be remedied. The construction of a straight-side tire, both the machine and hand operations, is illustrated in Fig. 1. In the machine operation, the stock required under *A* calls for proper width and gage. The gage of the fabric after it has been frictioned and skim-coated should be constant with a variation of about .002 to .003-inch. If the gage of the stock varies, it will cause either buckles or shy sidewalls in the finished tire. Operation 3 is the first place where one of the largest variables in the construction of a tire commences; that is obtaining the correct tension of the fabric as it is applied to the core. To keep this tension constant is one of the greatest difficulties for the following reasons. (1) Where the stock is lapped it is much stronger and requires more tension so that the sides can be stitched down properly without causing wrinkles. (2) When the operator cuts off the correct length, he can give it only approximately the same tension that it receives when it is directly applied with the machine.

PROPER BEAD LOCATION

A great deal of care should be taken in the next operation, 4, that of setting the bead. To eliminate a great deal of trouble in mashed beads and imperfect tires, a device shown in Fig. 2 may be employed with a great deal of success. This tire-building template is used to inspect the proper location of the bead. The "present method" shown in dotted lines is crude and frequently results in faulty bead location. The template-gage, however, is fool-proof and cannot be twisted in use, thus insuring proper bead location. It makes possible the inspection of the bead location after the next ply of fabric is stitched over it, thereby avoiding dislocation of the bead and an imperfect tire.

In applying the various plies of fabric, a great deal of care should be taken to distribute crossing laps so as to balance the tire, and as stated under number 7, the laps are not to cross

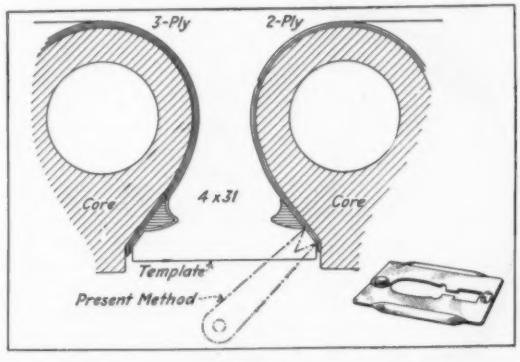


FIG. 2. GAGING PROPER LOCATION OF BEADS
INSERT—TIRE-BUILDING TEMPLATE

lower than 1½ inches from the bead. The reader will now begin to see variables that occur in tire building and that this particular case cannot be worked out with a positive result because the manufacturer relies on the operator to use his sense of judgment. Some of them should certainly receive credit as their judgment is sometimes really uncanny.

[1] This article may not be reprinted without permission of the author, who reserves all publication rights.
[2] Consulting production and efficiency engineer.

TUBING MACHINE TREADS

There are two kinds of treads, the tubing and the calender machine tread. The tubing-machine tread which is less costly than the latter, is not always uniform in shape, due to carelessness in feeding and maintaining uniform temperature of the stock. A tubing machine can be operated more efficiently and give the desired results if the temperature of the machine can be kept constant. Although it is water-cooled, the operator is usually relied upon for his sense of touch and feeling.

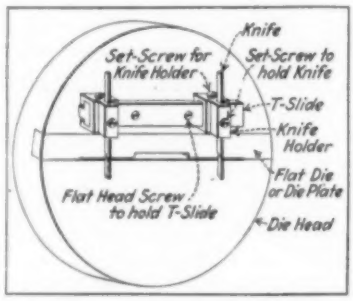


FIG. 3. FLAT DIE-HEAD FOR TUBING TREADS

A very good design of a flat die head for tubing treads is illustrated in Fig. 3, and has been used with a great deal of satisfaction.

ALLOWANCES FOR TREAD MEASUREMENTS

After the treads are extruded from the tubing machine they are put into books and placed on racks to cool. This is to allow for variations in width and shape while cooling. When the treads are cool they are cut to a given weight, plus or minus one ounce, with a variation in specified length of plus or minus three inches. The treads are then replaced in books and sent to the tire room where they are to be assembled on the tire carcass.

Before the tread is put on the tire carcass it is again weighed for specified weight with no variations, except that of length in which an allowance of plus or minus three inches is still maintained. This is a final check to avoid error—a rule that is not always adhered to by the weighers as many cases have been seen where a tread was stretched as much as ten inches.

ASSEMBLING TREADS

There are two methods of assembling treads used by the tire finishers. The first, which gives the best result, is to stretch the tire as it is put around the carcass, first one end and then the other. The second, which should be barred and actually is prohibited by some of the inspectors, is to stretch the tread around the carcass until the ends meet and then pull the tread from the carcass, thereby shifting the stretch. Here again the operator is relied on to give the uncured tread an even stretch so as not to affect the contour of the tire. If it is stretched too much at one spot, it may be the cause of a shy tire. Stretching the tread is essential so that the edges of the tread can be rolled down on the sides without wrinkling. Some tire companies have eliminated this variable by a mechanical device.

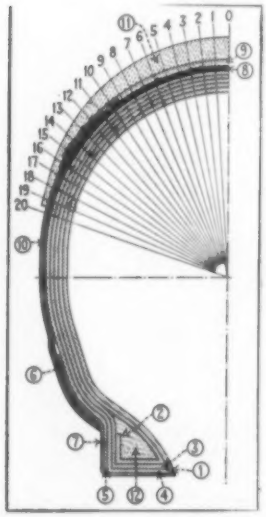


FIG. 4. PNEUMATIC TIRE LAY-OUT

MAKING AND ASSEMBLING CALENDER TREADS

The calender tread, which is the best-formed tread and can be kept very near constant, is a more costly operation. The most common method of running calender treads results in many treads being scrapped, due to air blisters. To eliminate this a tubing machine arranged back of a calender could be used. The tread is then applied to the tire in the same manner as the tubing-machine tread.

CALCULATING WEIGHT OF UNCURED TREAD

A formula for figuring weight of cured or uncured tread is shown in Table I. To use this formula a lay-out of the tire has to be made similar to that shown in Fig. 4, first laying out the core outline and then the contour of the tire from the dimension on the mold. Then around the core lay out the thickness of the

TABLE 1

RUBBER: Specific Gravity	RUBBER: Weight in Lbs. Per Cu. In.
1.35	.04883
1.36	.04919
1.37	.04955
1.38	.04990
1.39	.05027
1.40	.05064
1.41	.05100
1.42	.05136
1.43	.05172
1.44	.05208
1.45	.05245
1.46	.05281
1.47	.05316
1.48	.05353
1.49	.05389
1.50	.05425
1.51	.05462
1.52	.05498
1.53	.05534
1.54	.05570
1.55	.05606
1.56	.05642
1.57	.05679
1.58	.05715
1.59	.05751
1.60	.05787
1.61	.05823
1.62	.05860
1.63	.05895
1.64	.05932
1.65	.05968
1.66	.06004
1.67	.06040

FORMULA FOR FIGURING WEIGHT OF CURED OR UNCURED TREAD

A = Area reading of planimeter for uncured tread.
a = Area reading of planimeter for cured tread.
C = Circumference of tire.
V = Cubical contents of uncured tread.
v = Cubical contents of cured tread.
W = Weight of uncured tread.
w = Weight of cured tread.
K = Diameter of core.
F = Thickness of plies of fabric.
P = Thickness of padding.
B = Thickness of breaker.
R = Weight of cubic inch of uncured rubber.
r = Weight of cubic inch of cured rubber.

$$C = [K + 2(F + P + B)] \times 3.1416$$

$$V = C \times A \qquad v = C \times a$$

$$W = V \times R \qquad w = v \times r$$

(W) should correspond to (w) within 2 or 3 ounces. If there is more difference in weight than that specified above, use the following formula to get proper area for uncured tread, which will make (W) and (w) correspond.

$$\frac{w}{R \times (C - 3)} = A$$

Note—[Explanation of (C — 3)]—Three is subtracted to allow stretch on uncured tread so that the edges of tread can be rolled down on sides without wrinkling.

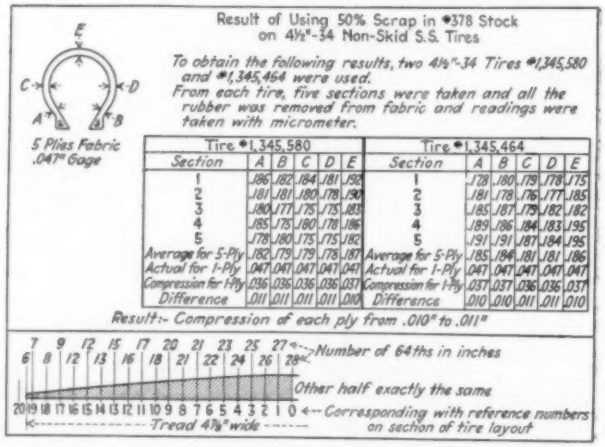


FIG. 5. UPPER—METHOD OF OBTAINING THICKNESS OF FABRIC PLIES. LOWER—LAY-OUT FOR DETERMINING TREAD MEASUREMENTS

various plies of fabric. The thickness of the fabric should not be laid out for its actual thickness but for the thickness of the fabric after it is vulcanized, or when it has received its final cure. To give a clear idea of how this is established, two tires are generally cut up, taking at least five sections from each tire and stripping off all the rubber, tread, breaker and padding. Then measure the thickness of the plies of fabric at *A*, *B*, *C*, *D* and *E* as shown in Fig. 5. The average per ply is then taken which gives the desired result. The padding and breaker are then laid out as shown in 8 and 9 in Fig. 4 and then comes the side-wall 10

that leaves the cavity for the tread 11. To get the correct measurements and area of this cavity, construction lines are drawn every one-quarter inch on the bottom of the tread cavity, as shown in the line construction in Fig. 4. Using these construction lines as points of measurements in the thickness of tread, a lay-out such as shown in the lower part of Fig. 5 will give a correct form of tread as it should come from the tuber or calender. In

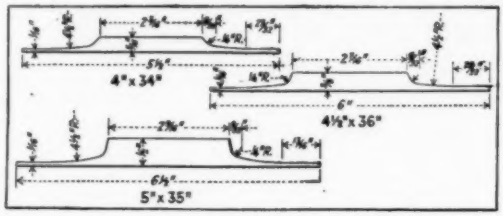


FIG. 6. CORD TIRE TREAD PROFILES

like manner shapes and forms of treads can be figured out and designed for cord tires, as shown in Fig. 6.

THE PLANIMETER

A word might be said here as to the planimeter instrument. Quite a number of people interested in the rubber industry are not familiar with this instrument which is illustrated in Fig. 7.

This ingeniously devised instrument is an indispensable aid to the calculations and computations necessary in the work of tire construction engineers, as it affords the most simple and convenient method of measuring the area of plane surfaces on drawings and

FIG. 7. PLANIMETER FOR MEASURING AREA OF PLANE SURFACES

plans. Accurate results can be obtained when the instrument is properly used. In cases of irregular surfaces, the results obtained cannot be equaled in accuracy by any compass and scale method of mensuration; and the time saved by using the instrument in such cases is very considerable. There are two types of planimeters: the polar planimeter and the rolling planimeter.

The polar planimeter, as its name implies, revolves with its tracer arm around a pole, and is therefore limited in its application by the length of the two arms, so that larger areas have to be

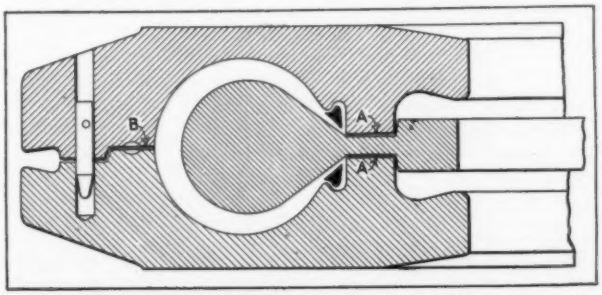


FIG. 8. DIRTY CORES CAUSE SHY SIDE-WALLS

measured in sections. The rolling planimeter differs from the polar planimeter in that it moves on two broad rollers. As the travel of these rollers is not limited, areas of any length, but not exceeding in width the movement of the tracer arm, can be measured in one operation. Contrary to the prevalent idea, planimeters are not difficult to use, but are very simple to operate.

THE NEED OF CLEAN CORES

Although a tire may be accurately designed and perfectly constructed, it does not always follow that the vulcanized tire will be a perfect product. One reason for shy tires is illustrated in Fig. 8. If the cores are covered with cement and dirt when assembled in the shells, the result is shown at *A*, and consequently there will be a large opening at *B*, allowing too much overflow, which prevents proper compression, causing shy sidewalls. The remedy is to keep the cores perfectly clean.

IMPORTANCE OF PERFECT CORE ALINEMENT IN MOLDS

Another instance of a perfectly good tire being spoiled in curing is illustrated in Fig. 9, where the core and built-up tire are placed off-center in the lower shell with the result shown at *A*

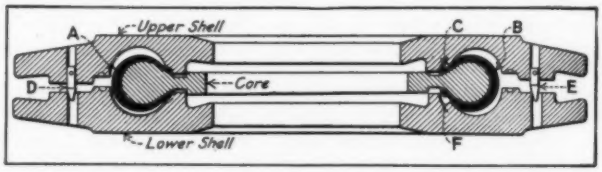


FIG. 9.—MISPLACING TIRE IN LOWER MOLD CAUSES IMPERFECT TIRES

and *B*. Thus when the upper shell, guided by dowel pins, is applied to the lower shell, the misalinement shown at *D* and *E* occurs, causing a greater overflow at *A* than at *B*. Uneven overflow results in open spaces through which live steam enters, causing shy tires. The remedy is perfect alinement of the tire and core, and the avoidance of moisture or water at *F*, which would turn into steam under this heat and cause imperfect beads.

A BATTERY TESTER NOT EASILY BROKEN

Car owners whose cars are equipped with a storage battery will be interested in the "Break-Not" battery tester. This hydrometer syringe is so constructed as to eliminate to a large extent the use of glass, and make it possible to carry in a tool box without danger of breakage. The manufacturer guarantees the accuracy of the tester. The float has large figures on the scale which are easily read and red danger marks indicate whether the battery is empty, half charged or fully charged. The bulb is large and made of strong red rubber. The other parts are: glass jar, hydrometer and rubber jar or tip; all of which are interchangeable and replaced without difficulty. The "Break-Not" comes packed in a strong chip-board mailing tube, with metal screw cover, and complete directions for making storage battery tests. — E. Edelmann & Co., 341 East Ohio street, Chicago, Illinois.

THE "BREAK-NOT" BATTERY TESTER

A Brief Analysis of Tire Fabric Manufacture

By H. R. Whitehead[1]

IN the early history of tire fabric manufacture it was deemed advisable to use nothing but Sea Island cotton which is the longest staple cotton grown. It was also thought that it was necessary to subject this to the combing process in order to obtain a superior quality of fabric. However, within the last few months there has been a general trend toward careful thought concerning cotton and the necessity of the combing process in the manufacturing of tire fabric.

CAREFUL CLASSIFICATION NECESSARY

One thing most certain in regard to cotton to be used is that it should have careful classification whether it be Sea Island, Peruvian, Peeler, Brazilian, Arizona, or any other type of cotton. Cotton does not run uniform in grade and staple from year to year or from consignment to consignment. Therefore, one of the most important men to consider in the textile mill is the cotton classifier. He should thoroughly examine every bale of cotton that is received by him and whenever a bale is found that is not up to the type specified, it should be rejected and not accepted at an allowance—a practice which is being carried on by a majority of the mills in all lines of fabric manufacture. While a gray or yellow tinged cotton is not necessarily detrimental to quality, a cotton that has met weather conditions which may damage the staple should not be used at any price. If this cotton is not examined by somebody thoroughly conversant with climatic effects upon cotton, a quality fabric will not be manufactured, no matter how carefully the cotton may be handled in the process of manufacture.

Today, one of the most vital points for the tire manufacturer to consider is the proper cotton to use in making up his fabric specifications. Within the past few months the writer knows that one of the largest cotton research bureaus of the country has been making flexing tests on the various growths of cotton and it will probably be surprising to some of the readers of this article to know that our own American peeler cotton has shown far greater flexing properties than all the other kinds of cotton with which we are familiar. Similar tests are being carried on with carded fabrics against combed fabrics and the result will be known in due time. If these reports continue favorable, it will mean a saving of millions of dollars to tire manufacturers, and it will also be a wonderful help to our American cotton growers and American cotton itself.

THE PICKING PROCESS

The rst process in manufacturing, after the cotton has been received at the mill and classified, is to arrange ten or twelve bales around the bale breaker and tear from each bale a sheet of cotton, similar to the method in which a sheet of paper is torn from the pad on which it is made, throwing a sheet from each bale at the same time upon the conveying apron. By a series of spikes placed upon an inclined apron, and a spiked doffer beater, the cotton is broken into small particles and by suction of a fan it is carried any distance required and dropped into bins for aging purposes, or conveyed directly to the opener picker, where it is automatically brought between two feed rolls. These rolls carry the cotton forward to a revolving beater that forces the cotton away from the feed-rolls and underneath which is a series of wires through which the impurities of heavy seed, not entirely removed by the gin, are driven to the floor below. Meanwhile, the good cotton passes along, automatically forming into a sheet, and is wrapped under compression into a roll of continuous yardage similar to the winding of a roll of wrapping paper. The object of the picking process is to remove only the coarser impurities.

CARDING THE COTTON

From the picker the cotton is carried to the cards, and here the finer impurities, which the picker has not taken care of, are removed. This is accomplished by placing at the back of the card the roll of cotton which has been taken from the picker and passing it through a feed-roll set, where the cotton is immediately acted upon by a drum entirely wound by saw-tooth wires. This drum drives beneath the card the coarser impurities left by the picker, the good cotton passing along to a large cylindrical drum wound with needle-point wires. Over this drum is a series of flats covered with needle-point wires, with the points so bent that there is a pulling action between the flats and the cylindrical drum, whereby the finer impurities are removed by a vibrating stripping comb which strips the impurities from the flats and winds them into a roll at the front of the card as a waste product. Another cylindrical drum situated directly in front of the one previously mentioned removes the good cotton, and a high-speed vibrating comb removes the good-quality cotton from the smaller drum. The cotton has all the appearance of a very fine spider's web when it is removed from the smaller drum, and by passing the web through a trumpet containing a very small hole, it is carried through the coiler automatically to a can placed under the coiler, which is removed when filled. The next step in combed goods is the sliver-lap machine, which forms a series of rope-like strands into a lap, or roll, formed similarly to that at the picker, only in smaller dimensions.

THE COMBING PROCESS

From the sliver lap the roll is conveyed to the ribbon-lap machine, which forms a lap very similar to the sliver lap. From here it is taken to the comber, the object of which is to remove any short fiber that the card has failed to remove. However, in the action of the comber the fibers must be straightened, due to the peculiar action of the comber upon them. In so doing, the spirality of the cotton is lost, and this matter has been the cause of a great deal of discussion as to the merits of combing in the production of tire fabric.

Originally, combing was practiced particularly on fine dress goods, or any particular fabric requiring very high counts of yarn, and especially on mercerized yarn. There is no doubt that a yarn of a higher luster and slightly cleaner is produced by the combing process. However, there is a question in the minds of some of our best textile men as to whether or not, for tire fabric purposes, the elasticity taken from the yarn in the combing process does not offset all the advantages claimed for it. The writer has discussed this matter with several textile men, and after exhaustive tests he believes that the comber is absolutely unnecessary in the manufacture of tire fabric. However, as before stated, research work is going on, and it is an experimental matter for the rubber companies to ascertain for themselves the bearing which this statement may have on their future product.

THE DRAWING FRAME

At the end of the comber the cotton is coiled into a rope-like form similar to that at the cards and is carried to the drawing frame. By a series of doublings of a number of the rope-like strands at the back of the drawing frame and the use of a series of rolls increasing in speed from the back rolls to the front rolls, the rope-like strands are condensed at the front of the machine into one single strand. The weight of this one strand is equal to the weight of one of the strands at the back of the frame, or any weight which is required. The doubling process

[1]General Superintendent, Textile Division, The Mason Tire & Rubber Co., Kent, Ohio.

MACHINES EMPLOYED IN PREPARING COTTON, SPINNING YARN, AND WEAVING FABRIC USED IN MAKING PNEUMATIC TIRES

at the back is used simply as a method of giving uniformity in weight to the finished product.

SLUBBING, INTERMEDIATE AND ROVING PROCESSES

From the drawing frame the cotton is taken to the slubber and one end of the drawing is placed at the back for each spindle on the slubber. Now begins the reduction of the rope-like strands to a fine or thread-like appearance through succeeding processes. The cotton at the slubber is wound upon a bobbin, the machine running automatically until the bobbins are full. They are then removed and taken to the intermediate frame, which is a machine very similar to the slubber, with the exception that the rope-like form at the slubber is wound from cans and at the intermediates, the bobbins from the slubber are placed in the creel at the back, and again the drawing process is used and the cotton at the front is wound upon bobbins still smaller than the slubber bobbins.

From the intermediates the cotton passes to the roving frame, which is identical with the intermediate, with the exception that the bobbin is even smaller than the intermediate bobbin. From the roving frame the cotton is taken to the spinning frame, and here the proper amount of twist is put into the cotton which will give the greatest breaking strength that can be obtained.

The necessity of the slubbing, intermediate, and roving processes is due to the fact that cotton cannot be drawn entirely by one process; that is, cotton in the carding processes should not be given a drawing process of more than five at any one machine. In the spinning room, however, it may be subjected to a drawing process as high as ten. It might be advisable to say that in explanation of the drawing processes, if one inch of cotton is entered at the back of the machine at a certain given time, it should not be stretched or drawn more than five or ten inches at the front of the machine in one given process, but must be gradually drawn through the succeeding machines as previously described.

SPINNING AND SPOOLING

Being limited at the spinning frame by the size of the ring, only a certain amount of yarn can be wound upon the bobbins. As this amount is not the yardage desired, the bobbins are taken to the spooler and the yarn upon the bobbin is wound onto the spool. As fast as one bobbin is exhausted the operator, using a very simple knot-tying machine strapped to the left hand, ties the end of another full bobbin to the end on the spool and by reason of the spool constantly revolving, exhausts the yarn from the bobbin which has come from the spinning frame. This method is continued until the spool is entirely full, when it is removed by the operator and an empty spool takes its place, and the method continued.

WARPING AND TWISTING

From the spooler the yarn is taken to the warper and from three to five hundred spools are placed in a creel. The ends from the spools are wrapped around a large warper beam revolving from thirty to sixty yards a minute. The yarn is drawn from the spools to the warper beam, forming a spool very similar to a huge spool of thread, and containing, not one end, but from three to five hundred ends drawn parallel, and giving a continuous yardage of these individual ends of from ten to twenty-five thousand yards, as required.

From the warper the yarn is taken to the twister, and in square-woven, chafing-strip, or breaker fabric, it is formed into a ply yarn. A ply yarn is composed of two or more strands of single yarn twisted together, and in the construction of the fabrics mentioned, ply yarns are entirely used. By a method of passing the yarn from the warper beam in which the yarn is separated into three strands, five strands, or whatever number are desired, the cotton passes through a set of revolving rolls, which deliver the yarn to the twister spindles. As the spindles on the twisters revolve at a high rate of speed, they immediately insert the twist desired. As soon as the yarn leaves the delivery rolls it is wound upon spools on the spindles, the yardage contained thereon being that specified in the fabric manufactured.

The manufacture of cord fabric requires one step beyond in the twisting process. The ply yarn necessarily must be cabled, as cord fabric is made from a yarn of this nature. Cable yarn is formed from the twisting of two or more ply threads together rather than from two or more single threads twisted together. The cabling process, with the exception of these facts, is exactly the same as the process of making ply yarn.

The spools are removed from the twisters and taken to the warp compressor. For each warp end desired in the fabric, a spool is placed upon a stationary spindle and the yarn passed through a porcelain eye, which is a means of guiding this thread. It is then carried to the front of the warp compressor and placed in a comb-like bar, which also guides it to the loom beam, which is very similar to the warper beam. By the rotation of the loom-beam drum and a proper tension on each individual spool, the yarn is drawn from the spools to the revolving loom beam and the fourteen to sixteen hundred ends are laid parallel upon this beam in exactly the same way as they were at the warper.

WEAVING THE FABRIC

When the loom beam is filled to capacity it is removed and taken to the loom, and as there are flanges extending on the sides of the loom beam, a tension is placed upon each individual thread so that in the succeeding process of weaving the yarn will be held taut. Each individual end is drawn at the loom, first through the harness, which contains a series of heddles, which are flat bars in the centers of which are eyes. Each heddle is supported on the harness frame and each thread is drawn through an individual eye in the heddle. Half of the threads are carried by one harness and the other half are carried by the second harness. By a cam motion, one harness is raised and the other harness lowered; that is, one-half of the ends are all carried upward and the other half are extended downward, leaving an opening directly in front of the reed, which is placed in front of the harnesses, for the shuttle of filling thread to pass between. The reed is composed of a series of wires through which spaces are formed and through which the individual threads are drawn regulating the number of threads that are required in the fabric to be made. As the harnesses open, the shuttle passes between, carrying a bobbin on which is wound the filling yarn, and as soon as the shuttle is received in the shuttle box, the motion of the loom is so timed that the harness that has been raised immediately lowers and the one that was lowered is raised at the same time, forming interlocking threads over the filling. By means of a roll at the front of the loom, as fast as the fabric is woven it is drawn at a certain speed around a take-up roll, which winds the finished fabric into a roll of any yardage desired. This method of raising and lowering the harnesses continues, and the filling is beaten into the fabric by the action of the reed, which rocks back and forth after each filling thread is placed across the warp; that is, simultaneously with the shuttle passing between the opening of the harnesses the reed is carried forward and pushes the filling thread into the fabric as desired.

The cloth is removed from the loom and carried to the finishing department where it is inspected, and any foreign matter removed by a series of brushes and shearing knives. By means of hot rolls the cloth is also calendered or laundered and the yardage determined at the same time. It is then ready to be delivered to the tire manufacturer.

The writer feels that the proper amount of research work has not been done with regard to construction of fabric, selection of cotton, and the advantages or disadvantages of the combing process. However, remarkable progress is being made, and within a short space of time he feels that manufacturers of tires will have awakened to the fact that there is an immense saving to be made in the selection of their tire fabric in the near future.

What the Rubber Chemists Are Doing

ESTATE RUBBER[1]

INFLUENCE OF HEAT

On dry rubber, heat is harmful only when the temperature rises high. The effect is stronger in proportion as the air has more access to the rubber and as more oxidation can take place. Short heating only produces a marked deterioration at 85 degrees C. (185 degrees F.) or higher. For more prolonged drying the limit seems to be somewhat lower, but in any case 50 to 55 degrees C. (112 to 133 degrees F.) is a safe temperature limit for drying-houses; when this limit is passed, a weak and sticky exterior gives warning long before the inner properties, especially the properties after vulcanization, are noticeably affected. The viscosity seems to be somewhat lowered by heating above 60 degrees C. (140 degrees F.), and only decreases markedly—at least after short heating—when the temperature reaches the neighborhood of 80 degrees C. (176 degrees F.). The rate of cure and slope are unchanged. It is only when the rubber is very strongly heated that a small decrease in the rate of cure is found. The tensile strength also decreases only at higher temperatures, probably in connection with oxidation or decomposition phenomena.

FAULTS AND DETERIORATION IN CREPE RUBBER

Faults in crêpe rubber may be many and of various kinds. Accidental admixtures caused by some oversight or negligence are of no general importance, although their causes are often difficult to trace.

SPOTS AND STREAKS

Several kinds of spots on crêpe may be caused during preparation, such as the following.

Lumps of preformed coagulum may be seen later as yellowish or violet-brown spots in the crêpe. Their quantity, however, is generally small, and when they are mixed up with the rest during compounding, no decrease in properties after vulcanization is generally found.

Violet coloration of the coagulum by oxidation on the surface which is in contact with the air may cause dark-violet or blue-black spots and streaks. This discoloration is caused by the oxidation of some non-rubber substances, and the rubber itself is not attacked. Although the small amounts of oxidation products cause a very sticky discoloration or streaking of the product, the harm to the rubber is negligible.

Some of the most common spots on crêpe are formed during drying, namely, when drying is too slow during periods of wet weather, or when the crêpe is not rolled thin enough. Orange, pink, violet, blue and dark-purple spots may develop, most intensively in the thickest parts of the crêpe. Similar spots may be formed if the dry, clean crêpe becomes moist after its despatch. For instance, from rain or sea water on the chests, or from storing on a moist cement floor, and also from packing-chests which are not dry enough. These spots are caused by micro-organisms, and as long as this exposure lasts only a short time, the exterior of the rubber may be largely damaged by the discolored spots, but the properties after vulcanization, and even the viscosity, are not harmed.

In certain cases the effect may become serious, and the properties may be very badly injured. The nature of the decomposition that causes such deterioration, and the organisms producing it, as distinct from those that cause only an innocent though very striking discoloration, are not yet known.

TACKINESS

Stickiness and tackiness may develop from very different causes, of which the principal are: (1) stickiness caused by too high temperature during drying; (2) stickiness caused by heating during milling; (3) tackiness caused by infection from soil or water; (4) tackiness caused by copper compounds; (5) tackiness caused by sunlight.

Concerning the chemical changes accompanying tackiness, relatively few data are available, and the different types of stickiness have not been separately studied and distinguished.

FAULTS IN SHEET RUBBER

Trouble from faults in sheet rubber is certainly not less than with crêpe. One great advantage of smoked sheet is that the brown smoke-color covers and makes invisible many differences in shade which may give so varying an exterior to unsmoked sheet. Even the violet discoloration, caused by oxidation on the surface of the coagulum, becomes practically invisible when the sheets are thoroughly smoked. Against this advantage in smoked sheet this form of rubber has two distinct disadvantages which tip the balance in favor of crêpe rubber, as far as trouble with the exterior goes. The first is, that the form of sheet rubber is of importance and that every deformation remains visible, while with crêpe this can be restored by recrêping. The second disadvantage of sheet rubber is formed by the larger content of serum substances which cause such faults as greasiness, mouldiness and rustiness. Tackiness may occur, of course, in sheet rubber as well as in crêpe. Spots are less important than in crêpe. Still, colored patches caused, for instance, by *Bacterium prodigiosum* may occur on sheets, and spots caused by fungi may also be found.

MOULDINESS

Perhaps the most serious defect in sheet rubber is the great susceptibility to mouldiness of the output of many estates. In former years this defect did not trouble the planters so much, as the rubber was sent away from the estate before any mouldiness could develop, and at the ports the rubber was regularly and rapidly handled and shipped. During the war, when shipment was held up, this trouble made itself felt in the producing countries, and has perhaps formed one of the most important complaints.

It may be assumed that the majority of cases of mouldiness is caused by chests getting wet during transport. If the water actually reaches the rubber, it is absorbed by the sheets, which then show large, white, opaque patches, like partly dried sheets, and with mould developing in many places, a most unsightly lot of rubber is formed, though the real harm done is generally not very great. It does not seem possible to make sheet rubber wholly immune to fungi, as indeed is the case also for crêpe.

GREASINESS

By greasiness is meant a somewhat sticky and moist feel of the sheet. In a moist atmosphere such sheet may absorb so much moisture that little drops are found on the surface, as if the sheet had sweated. It would be best to confine the term greasiness to a hydroscopicity of the sheets caused by serum substances which attract moisture from the atmosphere. This kind of greasiness is generally coupled with a strong tendency to mouldiness, and is prevented by soaking the sheets in water, after milling, so that the easily-soluble hydroscopic serum-substances are extracted. These two defects, greasiness and mouldiness, do not always go hand in hand.

The details of the origin and the cause of greasiness are not yet known. For estate practice the most important point is that greasiness may be prevented by the same means as that applied for reducing the susceptibility to mouldiness, namely, soaking the freshly-rolled sheets in water. Even dry sheets that show greasi-

[1] "Estate Rubber, Its Preparation and Testing." By Dr. O. de Vries, 1920. Abstract from Chapter 12.

ness may be cured to a large extent by soaking them in water and hanging them to dry.

As far as is known, greasiness has no marked influence on the inner properties. A direct deterioration of the rubber or real harm to the inner properties therefore is not to be feared. As this defect is so often coupled with a large tendency to mouldiness, it is quite reasonable that greasy sheets are not classed under first quality and are not accepted without protest.

RUSTINESS

"Rust" is the term applied to a thin, invisible film on the sheets which breaks and becomes visible when the sheet is stretched. On unsmoked sheets it has a yellowish-white color, on smoked sheets it becomes brown, or rust-colored. This film is formed by the growth of micro-organisms in the wet layer on the outside of freshly rolled sheets. These organisms decompose some of the serum constituents—probably the sugars—and form a very voluminous, jelly-like substance which dries to an invisible, cohesive film.

The organisms are aerobic, that is to say, they grow only when sufficient air is present. They prefer dilute solutions of serum. Soaking the sheets in water after milling does not hinder the rubber from becoming rusty. On the contrary, such sheets may show rustiness to a very large degree, if the organisms have time to develop.

It is worth while to state clearly that rustiness is caused by a *decomposition* of serum-substances by micro-organisms, while greasiness arises when *undecomposed*, hygroscopic serum-substances dry up on the sheet. Soaking the fresh sheets in water may help to prevent greasiness but does not help against rustiness.

Rustiness itself produces no changes in the inner properties of the rubber. The thin layer of harmless substances is found only on the outer surface, since air is necessary to the growth of the organisms. The interior of the sheets is not affected, and after the sheets are once dry, the changes cease, while rusty sheets, probably in connection with the changes by which rustiness is caused, are not hygroscopic.

As rustiness occurs only when the sheets are left in moist condition for some time after milling—24 hours or more, a beginning of maturation of course takes place, so that rustiness is usually accompanied by a somewhat greater rate of cure and often by a higher viscosity. O. de Vries and H. J. Hellendoorn, who investigated rustiness[2], state as follows:

"On keeping rusty sheets for several years, no deterioration takes place and the properties change in the same way as in the non-rusty controls."

Rustiness therefore must be classed among the harmless defects and should not form the base of any claim.

GAS BUBBLES

Small, eventually microscopic bubbles that are sometimes found in sheet are mostly called air-bubbles. It is, however, more to the point to call them gas-bubbles, since bubbles really caused by air may be regarded as rather an exception.

In most instances the bubbles in sheet are filled with gases which are formed in the latex and the coagulum, for instance by micro-organisms; therefore, in the first place, carbonic acid; further, probably nitrogen and some methane. On the composition of these gases very little is known as yet.

The bubbles themselves, as inclusions of innocent gases, probably have no effect at all on the inner properties of the rubber. The processes by which they are produced—decomposition of serum-constituents, maturing, etc.—generally cause a somewhat quicker cure and higher viscosity so that one may expect these also in sheets with gas bubbles.

[2]Archief voor de Rubbercultuur, 2, 1918, 527 and 536.

THE VARIABILITY OF CRUDE RUBBER[1]

The author of this paper mentions the early observations and explanations of the variability in the rate of cure of plantation rubber and summarizes the work of Eaton, who concluded that there are two agencies present in plantation rubber which act as accelerators in vulcanization. These are:

(1) The vulcanization accelerating agent formed by the biological degradation of proteins or organic nitrogenous matter in the coagulum during the early stages of drying.

(2) A vulcanization accelerating agent, performed in the latex and retained by the dry rubber under certain conditions of preparation. The second substance may possibly be identical with the first, although there are certain indications that they are different.

The accelerator formed by the degradation of the proteins consists probably of an amine or amino acid, probably the former, since it is known that putrescine, which is a degradation product of animal proteins, behaves like an accelerator.

Eaton and his coworkers arrive at the conclusion that the variability in crude rubber is the variability in the amounts of accelerators which may exist before coagulation or may be formed later, and which by the processes of washing and drying are permitted to remain in the crude rubber.

EFFECT OF ADDED ACCELERATORS

The vast bulk of plantation rubber today is used in mixings in which either organic or inorganic accelerators are present in sufficient quantity to produce a fairly rapid cure. For this reason, it seems as though the work which has been done has been for the benefit of a very small amount of plantation rubber, and does not apply to the balance. We may divide the substances found in crude rubber, which may influence vulcanization, into two classes:

(1) The accelerators formed in the latex or in the coagulated rubber.

(2) Retarding agents which have been added to the latex or coagulum (such as any coagulating agent which has not been removed by washing), or substances in the smoke which are absorbed by the rubber, etc.

These two classes of substances will always react one against the other, as Eaton has pointed out. The balance between the two will determine the rate of cure. These substances are necessarily present in very small quantities, and consequently variations, which in themselves are small, will in the absence of fillers and added accelerators produce considerable effect on the rate of vulcanization and the tensile properties. When accelerators are used these differences are of little importance, because the amount of accelerator which is added to a compound is sufficient in itself to vulcanize the compound correctly, and the presence of these minute amounts of accelerators found by Eaton will have little, if any, effect on the vulcanization and tensile properties of such compounds. Not only are these differences small, but they are not necessarily indicative of the true quality of the rubber.

The author at various times has tested rubber which had different rates of cure when rubber and sulphur only were used, and found that in many cases these differences largely disappeared with the addition of two to four per cent of litharge, or 0.5 to one per cent of the common accelerators, such as aniline, hexamethylene tetramine, etc.

The whole point in discussion is that it is not sufficient to bring together rubber and sulphur, and assume the presence and action of an accelerator, merely because one method of preparation produces a somewhat more rapid cure than another. Results show that with many organic accelerators it is necessary to have the proper environment in order to develop the maximum, or even any accelerating action.

For testing the rate of cure the proper procedure would be to add to each mixture a sufficient quantity of zinc oxide to be certain that the vulcanization will take place in an alkaline medium.

[1]Abstract of paper presented by John B. Tuttle before the Rubber Division at the 58th meeting of the American Chemical Society, Philadelphia, Pennsylvania, September 2-6, 1919.

Probably 2 to 5 per cent would be sufficient for this purpose, and the results thus obtained would be of real value in determining the variation in the rate of cure, because in this way the conditions of vulcanization would be more uniform than is the case at present, and the results more truly comparable.

ONAZOTE—EXPANDED VULCANIZED RUBBER[1]

Pure rubber with or without the addition of vulcanizing materials when subjected to high gas pressures and high temperatures in an autoclave, tends on release of the pressure or on cooling, to lose the greater part of the occluded gases. The mass may be made to retain large quantities of gas under pressure by the addition of substances which reinforce or close the pores of the thin walls which constitute the reticulated structure. Substances of a waxy or resinous nature serve this purpose. The addition of such substances also lowers the pressure necessary for complete gas penetration, 75 atmospheres usually being sufficient. When using crêpe plantation rubber, high melting point ceresine wax and light magnesia in equal parts to the extent of five to ten per cent of the weight of raw rubber with sufficient red antimony and sulphur to effect hot vulcanization, are sufficient for the purpose.

As an aid in retaining the gas pressure a strongly resistant rubber skin is readily obtained by covering the raw material of the expanded rubber with a rubber compound which will not itself retain gas under pressure and will form a strong resisting cover for the gas expanded material. This skin of rubber being vulcanized to the expanded rubber interior, becomes an integral part of the whole during the process of vulcanization, and is, therefore, enabled to withstand punctures and external injury without decrease of efficiency of the expanded rubber.

The apparatus employed for producing and curing expanded rubber consists of two principal parts or metal tubes fitted with removable steel end caps. One of these shells is placed inside the other. The inner one contains the rubber and controls the pressures at the beginning and end of the process when applied to the material to be treated. Central openings through the steel end-caps are suitably arranged and fitted with adjustable check and pressure valves controlling the pressure automatically at certain stages of the process. A similarly constructed outer shell controls and operates the application of the high gas pressure to the inner one.

In making expanded rubber it is of utmost importance to provide a sealing matter of high melting point which will readily permit the gases to pass through the rubber when submitted to high gas pressure, and afterwards automatically to seal permanently gas-tight all porosity. To effect this a waxy or resinous matter is used as a flux which produces a liquid state by the action of heat and facilitating the entry of gas through the rubber.

The natural extent of pressure capable of retention by the rubber substance, without the skin support referred to above, is not over two atmospheres. To obtain a product holding a higher pressure requires the use of a substance capable of absorbing high pressure and to control the expanding action of the gas by a strong resilient skin which will not retain the gases. It is very necessary that this should be done during the expansion process.

The shell, loaded with rubber mixing and tightly capped, is placed in a heated chamber at 200 degrees F. and kept there until thoroughly heated. If a substance is required to contain five atmospheres' pressure when fully expanded, the check and pressure valves are set at 100 pounds before insertion of the shell into the outer tube or "gun." The pressure is supplied to the apparatus by means of high-pressure cylinders or a pump.

When the pressure enters the inner shell through the regulating valve, heat is applied by a steam jacket surrounding the "gun" and gradually increased simultaneously with the gas pressure until the full vulcanizing temperature is reached, which is usually about 305 degrees F.

It is necessary to maintain a pressure of about 70 to 75 atmospheres until the vulcanization is complete, usually in two hours, more or less. The quality or fineness of the froth formation is determined by causing a sudden drop in pressure when the temperature has lowered to 50 degrees F. The pressure trapped in the inner shell by the automatic valve at 100 pounds acts as a resilient counter-pressure to the rapid expansion within the contents of the shell and prevents its disruption. To exhaust the pressure from the shell, a gas-releasing device is employed.

Commercially the expanded rubber described is known as Onazote and weighs only four pounds per cubic foot. This material was one of the novelties exhibited at the Fifth International Rubber Exhibition in London last June.

[1]C. L. Marshall, Dunoon, Doyle Gardens, Harlesden, London, British Patent No. 162,176.

PLANTATION SCRAP RUBBERS[1]

Scrap rubbers generally give low values for ultimate tensile strength and elongation, the inferiority being due to the presence of foreign matter not removed by washing; the mineral constituents, particularly the particles of sand, are mainly responsible.

Repetition of earlier experiments confirm the results previously recorded, that (1) smoking usually lengthens time of cure of sheet rubber without markedly affecting the mechanical properties of the rubber, (2) that different methods of drying have little effect on the vulcanizing and mechanical properties, (3) that rubber allowed to remain in a moist condition is quick curing, and, (4) that thin crêpe rubber cures slowly, whereas blanket crêpe approximates in this respect to ordinary sheet.

[1]"Causes of The Inferiority of Plantation Scrap Rubber." Bulletin of the Imperial Institute, 18, 1920, 1-22.

CHEMICAL PATENTS
THE UNITED STATES

RUBBER COMPOUNDING MIXTURE. A FLUID MIXTURE CONSISTING of a resinous substance and a relatively non-volatile solvent. —George J. Chertoff, Cleveland, Ohio. United States patent No. 1,379,743.

MANUFACTURE OF RUBBER. A PROCESS FOR PREPARING HIGH-grade raw rubber direct from the latex without evaporating, drying or smoking, as follows: First, treating the latex, as soon as practicable after being tapped from the trees, with a dilute aqueous solution of alkalinized phenol to preserve the latex in a fluid and sound condition for any required length of time prior to coagulation; second, adding thereto a dilute solution of a suitable acid in sufficient quantity to neutralize the alkalinity of the preservative treatment and acidify the latex, whereby nascent phenol is liberated and energetic coagulation of the contained rubber in the latex takes place; and third, subjecting the coagulum of rubber to a mechanical dehydrating treatment.—Samuel Cleland Davidson, Belfast, Ireland. United States patent No. 1,380,640.

ART OF COMPOUNDING RUBBER. THE METHOD OF PRODUCING VULcanized rubber by dissolving an accelerator, mixing the solution with a compounding ingredient, incorporating the mixture with rubber, and vulcanizing the rubber compound.—Clayton W. Bedford, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,380,765.

FABRIC FOR AIRSHIPS AND PROCESS. THE PROCESS CONSISTS IN coating a basic material, proofed with rubber, with a film of oil of the class which dries by polymerization.—Henry A. Gardner, Washington, D. C. United States patent No. 1,381,412.

FABRIC FOR AIRSHIPS AND PROCESS. THE PROCESS CONSISTS IN treating a cloth base with a fireproofing solution, removing the excess solution by passage through a series of rollers, and coating the cloth with a dope containing an oil of the class which dries by polymerization.—Henry A. Gardner, Washington, D. C. United States patent No. 1,381,413.

TREATMENT OF RUBBER LATEX. IN THE COAGULATION TREATment of rubber latex which, while still in perfectly fresh condition after being tapped, has been preserved with an alkalized

phenol or phenoloid, the employment of a coagulating fluid consisting of an acidified aqueous solution of a soluble salt of magnesium for effecting the coagulative separation of the raw rubber.—Samuel Cleland Davidson, Belfast, Ireland. United States patent No. 1,381,455.

THE UNITED KINGDOM

INDIA RUBBER COMPOSITIONS. STIFF AIR-DRIED GLUE CONTAINING 5 to 15 per cent of water is incorporated with unworked rubber in a mixing machine, the action of which produces sufficient heat to render the materials a plastic and homogeneous mixture. Preferably the temperature is allowed to rise to 280 degrees F. to evaporate much of the contained water and permit vulcanization of the product without further drying.—H. Wade, 111 Hatton Garden, London (The Goodyear Tire & Rubber Co., Akron, Ohio.) British patent No. 161,482.

INDIA RUBBER COMPOSITIONS. FINELY DIVIDED SOLIDS, SUCH AS carbon black or zinc oxide, which are added to rubber as pigments or fillers, are first mixed with a solution of glue or other colloid, which has been emulsified by means of a volatile liquid such as benzol or toluene. The emulsion is then mixed with the rubber, and the volatile liquid is removed during the subsequent drying process.—H. Wade, 111 Hatton Garden, London (The Goodyear Tire & Rubber Co., Akron, Ohio.) British patent No. 161,483.

HEATING INDIA RUBBER. IN THE HEAT TREATMENT OF RUBBER for reforming or vulcanizing, a solution is employed having its boiling point at or slightly above the temperature required, the solution being at or slightly below the boiling point. Solutions of calcium chloride of various strengths are preferred, the boiling points of which rise approximately ten degrees F. for every half-pound of salt to 1½ pints of water. Articles or molds containing them may be immersed directly in the liquid, or placed in a jacketed vessel, the jacket of which contains the solution directly heated or circulated from an outside heater.—H. Gare, care of Grove Rubber Co., Limited, Bramallmoor Lane, Hazel Grove, Stockport, Cheshire. British patent No. 161,648.

SPONGY INDIA RUBBER. THE PROCESS OF MANUFACTURING POrous or expanded rubber by vulcanization in an inert gas under pressure.—C. L. Marshall, Dunoon, Doyle Gardens, Harlesden, London. British patent No. 162,176.

VULCANIZING INDIA RUBBER. THE COLD VULCANIZATION PROCESS described in patent No. 129,826 is modified by the application of one or both of the gases used at a pressure greater than that of the atmosphere.—S. J. Peachey, 5 Yew Tree Road, Davenport, near Stockport, Cheshire. British patent No. 162,429.

OTHER CHEMICAL PATENTS

GERMANY

PATENTS ISSUED, WITH DATES OF ISSUE

NO. 338,295 (September 2, 1919.) Process of regenerating rubber. Xylos Rubber Company, Limited, Manchester, England, represented by Dr. W. Karsten and Dr. C. Wiegand, patent lawyers, Berlin S. W. 11.

FRANCE

PATENTS ISSUED, WITH DATES OF ISSUE

477,054 (May 22, 1914.) Elastic mass. F. Aichlburg.
477,275 (July 28, 1914.) Process of manufacturing solid plastic masses. H. Hagendorf and A. Breslauer.
477,956 (July 9, 1919.) Process of producing diolefines (isoprene) from rubber, bodies containing rubber, homologs and analogs of rubber, as well as from mixtures of rubber and from vulcanized products with a base of rubber. H. Stern.
503,975 (December 22, 1917.) Process of making halogened hydrines. T. and E. H. Kerfoot.
504,179 (September 24, 1919.) Improvements in the manufacture of acetic acid. The Shawinigan Water & Power Co.
505,701 (August 27, 1918.) Process for accelerating the vulcanization of rubber and similar substances. Compagnie Parisienne des tissus caoutchouc et simili-cuir.
506,281 (January 31, 1918.) Continuous process of manufacturing acetone. R. P. T. Duchemin.
506,868 (December 2, 1919.) Method of treating rubber. The Hunter Dry Kiln Co.
510,187 (July 11, 1919.) Improvements in the method of vulcanizing rubber. E. Tilche.
510,197 (July 18, 1919.) Improved process of vulcanizing rubber. E. Tilche.
510,875 (February 28, 1920.) Leather and imitation leather, issued for footwear coverings for floors, belting, tires, etc. Ilie Patent Wear-proof Rubber, Leather & Fabric Co., Ltd.

LABORATORY APPARATUS

LABORATORY GAS BURNERS

THE burner shown in the illustration is one of several forms made for laboratory use. It is a heating burner, without stand concerning which the makers state that it will give more heat with less gas than any other burner, due to perfect combustion. The air and gas are regulated at one time by a patent air mixer which assures economical gas consumption.

THE TIRRILL BURNER

There is complete control of the length and color of the flame and no clogging or flashing back. Also, it holds a low flame in any draft and burns at any angle, using all kinds of gas at any pressure.—Tirrill Gas Machine Lighting Co., 50 Church street, New York, N. Y.

PAPER FILTER CONES

Perforated paper cones to protect filter papers are made by folding in the ordinary way a 5.5 cm. "hardened" filter paper and punching eight or more small holes about 2 mm. in diameter. After the cone is opened out it is fitted to the funnel, together with the main filter paper, by wetting and pressing firmly with the fingers. Some of its advantages are:

(1) Negligible cost, especially as compared with platinum. (2) Perfect fit, due to the fact that it can be molded while wet to fit each particular funnel. (3) No sharp edges to cut the overlying paper. (4) Unaffected by acids or other reagents for which filter papers can be used.

Aside from these distinct advantages some other points should be mentioned. If the cones are permitted to dry out after using (a convenient way is to leave them standing in the funnels) they retain their shape and can be used over again repeatedly. The strength of the cones is sufficient to withstand any ordinary vacuum used for filtering in the laboratory.—Seth S. Walker in *The Chemist-Analyst*.

THE NATIONAL CHEMICAL EXPOSITION

Extensive preparations are being made for the coming National Chemical Exposition, and it is predicted that this seventh annual exhibit will be a most important one, where many new phases of chemical development will be represented.

The show will be held in the Eighth Coast Artillery Armory, New York, N. Y., during the week of September 12. One of the important features of this exposition will be the fact that all the exhibits will be on one floor, while another great improvement over preceding gatherings of the kind is the securing of an auditorium with a capacity for seating 1,400 people.

Among the exhibits will be a silent chain drive displayed by the Morse Chain Co. This firm will also exhibit a number of samples of chains of different sizes, in order to illustrate the Morse rocker joint. By means of these displays the advantages to be derived from the use of this company's silent chain drives will be ingeniously advertised.

The program, as far as planned, will include the following addresses, of especial interest to the rubber industry:

"The Relation of Atmospheric Conditions to Chemical Processes," by A. E. Stacey, Jr., of the Carrier Engineering Corporation; "Drying and Drying Problems," by H. S. Landell, of the firm of Proctor & Schwartz; and an address, the title not yet stated, by E. G. Rippel, of the Buffalo Foundry & Machine Co.

Pitch Hydrocarbons Used in the Rubber Industry[1]

By Frederic Dannerth, Ph.D.

A Study of Technical Properties, Sources, Definitions and Uses of Solid Hydrocarbon Residues, Both Natural and Industrial

At a time when the market price of standard pitches varies from $25 to $50 a ton, many large manufacturers of rubber goods, and especially those making rubber-coated fabrics, might well consider the desirability of installing their own pitch-mixing departments. The manufacturer, knowing the chemical character of the materials which are put into the compounds, could then control his processes more accurately. The fact that pitch is a "specific material" for correcting microporosity, is now generally acknowledged. Aside from this it offers to the compounder a clean and practical method for incorporating finely divided carbon with the rubber compound.

The use of coal-tar for waterproofing textile fabrics dates back to about the year 1820, but the discovery that high-melting-point pitches are valuable and important compounding materials is of far more recent date. The word "pitch" as used at present in industrial work, designates all those natural or artificial distillation residues, which are black, soft and sticky at high temperatures, but hard and brittle at ordinary room temperature. In certain cases they may be tenacious or elastic at ordinary temperatures. The characteristic types are: lake asphaltum occurring in Venezuela and a nearby island; gilsonite from the mines of Utah; the residues from coal-tar, petroleum, fatty acid, and hardwood distillation.

It appears necessary to say a word about the numerical values quoted in connection with the present series of articles on organic materials used in the rubber industry.

Materials obtained from plants and animals, as a rule, have two or three properties which are quite constant, provided the material is a true *chemical* compound not admixed or adulterated with any other substance having similar properties. These three properties are called "constants." They are: the melting point, the boiling point, and the specific gravity. For example: commercial 90 per cent benzol if tested by the distillation test, will show this property: 90 per cent of the liquid will boil over or "distil" before the thermometer has registered more than 100 degrees C. Pure benzol, however, is a chemical entity, and its formula is well known to chemists. The pure article has been examined by thousands of persons, and wherever tested it is found to boil at a temperature close to 80.5 or 81 degrees C. It has a freezing point of 4 degrees C., which means that it goes over into the solid form of crystals at that temperature. It has a specific gravity very close to 0.880 compared with water at 20 degrees C.

In the case of oils, fats, waxes and resins the fluctuation in the numerical values is at times very obvious. In such cases the chemist concludes that he has before him substances not chemically pure and of indefinite chemical composition. For that reason it is customary to differentiate between "chemically pure" substances and "commercial materials." Specimens of commercial materials are frequently found to be admixed with other materials in indefinite proportions, or it may simply be that they have been carelessly prepared.—The Author.

SPECIFICATIONS

The choice of a pitch for compounding purposes will depend in a great measure on the purposes for which the finished rubber product is to be used. In other words, the "external influences" to which the finished rubber goods will be exposed. The questions which the consumer must keep in mind are these:

1. Will the black color of the pitch interfere with the use to which the finished product will be put?
2. Does it impart any peculiar or unpleasant odor to the goods?
3. Is the melting point of the pitch so low that the finished product is too supple—that it has not enough "spring" or "come-back" to it?
4. Does it contain any matter which will volatilize below the temperature at which the rubber compound will be vulcanized? In other words, will the pitch cause blistering?
5. What is the influence of high-pressure steam, volatile organic solvents and oils on rubber compounds containing this pitch?
6. Do the rubber compounds containing it resist abrasion?
7. What is the maximum percentage which can be used to advantage in a recipe for a given type of rubber compound?
8. To what extent will compounds containing this pitch resist abrasion, hammer blows, and other physical influences?
9. What is the best form in which to deliver it to the compounder so that it can be mixed uniformly in the shortest possible time? Should the pitch be granulated?
10. Is the vendor willing to deliver it in metal drums to avoid the danger of wood-splinters in the compound?

DEFINITIONS

The use of bituminous materials for building roads, pavements, and roofing, as well as for plastic masses, has led to the formal definition of many of the terms used in the industry. Some of the most important of these are:

1. ASPHALTS. Solid or semi-solid native bitumens; solid or semi-solid bitumens obtained by refining petroleum; solid or semi-solid bitumens which are combinations of those already mentioned with petroleums or derivatives thereof. They melt upon the application of heat, and consist of a mixture of hydrocarbons and their derivatives. They are of complex chemical structure, largely cyclic and bridge compounds.

2. BITUMENS. Mixtures of native or pyrogenous hydrocarbons with their non-metallic derivatives. These materials are soluble in carbon disulphide.

3. ASPHALTENES. The components of the bitumen in petroleum, petroleum products, malthas, asphalts, and solid native bitumens which are soluble in carbon disulphide, and insoluble in paraffine naphtha (gasoline).

4. CARBENES. The components of the bitumen in petroleum, petroleum products, malthas, asphalts, and solid native bitumens, which are soluble in carbon disulphide, but insoluble in carbon tetrachloride.

5. PETROLENE. That part of the bitumen which is soluble in petroleum spirit is designated as petrolene. This extraction is to be carried out first, and the extraction with carbon disulphide is carried out secondly. It is of particular importance in the case of petroleum pitches.

6. FREE CARBON. That part of a pitch which is insoluble in

all of the volatile organic solvents is designated as free carbon to distinguish it from that carbon which is chemically combined with other chemical elements. In the examination of coal-tar, a determination of this carbon is found to be of great value. Among the solvents which have been used by coal-tar chemists for the test are: carbon disulphide, aniline, glacial acetic acid, benzene, toluene, and xylene.

NATURAL ASPHALT PITCH

Trinidad asphaltum with 56 per cent bitumen is obtained from Asphalt Lake on the island of Trinidad, off the coast of Venezuela in South America. Bermudez asphalt contains about 75 per cent bitumen, and is found in Venezuela. The analysis of refined Bermudez asphaltum shows in round numbers:

	Per Cent
Bitumen soluble in carbon disulphide	75.0
Organic matter not bitumen	3.5
Non-volatile mineral matter	21.5
	100.0

Carefully refined Bermudez asphaltum shows as high as 90 per cent of actual bitumen. These asphalts are by some considered to be alteration products of petroleum hydrocarbons, resulting from evaporation and oxidation.

Another type of rather pure solid bitumen is known as gilsonite, and is found on the Uintah Indian reservation in Utah. As early as the year 1900, the annual production was approximately 7,000,000 pounds, and the demand for the material as a waterproofing agent and as a raw material in rubber works has increased this figure. The chemical analysis of gilsonite shows that the amount of matter soluble in carbon disulphide varies from 90 to 95 per cent.

An examination of natural pitches should invariably include a determination of "*Loss on heating to* 150 *degrees C.* (about 300 degrees F.) *for five hours*," as it has been found that some of them contain a considerable amount of volatile organic matter.

COAL-TAR PITCH

Coal-tar is a thick, viscous liquid obtained in gas-works when bituminous coal is heated to high temperatures in retorts. By this operation gas is driven off and after purification it is collected in suitable tanks; ammonia is also driven off as a gas and is absorbed by sulphuric acid. Some of the fumes which distil off are very heavy and for that reason they condense shortly after leaving the hot retorts, as a tarry mass which is collected in suitable "tar-wells." From here the molasses-like tar is pumped into tank cars and delivered to the coal-tar refinery, a separate and distinct industry. The coal-tar refiner subjects the material to a series of distillation processes whereby he removes (1) water, (2) light oil, cut at 200 degrees C., (3) middle oil, cut at 270 degrees C., and heavy oil, cut above 270 degrees C.

The hard pitch which remains in the still after the third or anthracene oil fraction is distilled off, constitutes the material known in commerce as "hard pitch." If the distillation is stopped at 270 degrees C., the material which remains in the still will be "soft pitch," with a melting point below 90 degrees C. (195 degrees F.).

TESTS

The tests usually applied to coal-tar pitch are mostly physical. Specific gravity is determined in the manner used for solids. Evaporation loss is determined by exposing in an air bath at 160 degrees C. for seven hours. Melting point is determined by heating a cube of pitch in water while it is suspended from a wire. Free carbon is determined by extraction with toluene and benzene in an Underwriters' extraction flask.

Coal-tar is a mixture of hydrocarbon distillates, mostly *un*saturated ring compounds, and coal-tar pitch, being a solid residue of this material, contains the same type of chemical substances. It will be recalled that the petroleum pitches contain mostly cyclic and bridge compounds.

HARDWOOD PITCH

In the process of distilling such woods as oak, beech and maple, a number of products are obtained as in the case of coal distillation. Acetic acid, alcohol, and wood-tar are obtained as liquids, while charcoal remains in the retort at a temperature of about 427 degrees C. (800 degrees F.).

The tar is later distilled separately and the oils which come off are collected and fractionated up to a temperature of about 200 degrees C. At the end of this distillation the hard-wood pitch remains in the retort. It can be produced in grades which melt at 100 degrees C., or as high at 150 degrees C. The former would show about 95 per cent of matter soluble in chloroform, while the latter would contain not much more than 50 per cent of matter soluble in that liquid. A pitch of melting point 100 degrees C. may contain as much as 40 per cent of matter soluble in (denatured grain) alcohol, and will show about 1.250 specific gravity.

PETROLEUM PITCH

When liquid native bitumens (petroleum) are treated with a current of air while they are being heated, the volatile parts of the petroleum are driven off and an asphalt-like product known as "blown petroleum pitch" is obtained. This is sometimes called Byerlite. Thomas T. Gray, the American petroleum expert, claims that the asphalt residues from crude petroleum so closely resemble the natural asphalts that the two cannot be distinguished with certainty.

The melting point of these pitches is determined by the ball and ring method. This depends on the use of a steel bicycle ball weighing five grams, which is allowed to drop through a disk of asphalt 16 millimeters in diameter. In the petroleum industry, the bitumen soluble in petroleum spirit has been designated as "petrolene," and the part soluble in carbon disulphide has been called "asphaltene."

Pennsylvania petroleum is a "paraffine base" oil, as it yields solid hydrocarbons of the paraffine series, while California petroleum has an "asphalt base." It is rich in asphalt and contains practically no solid paraffines, although it contains a large proportion of nitrogen bases of the pyridine and chinoline series.

The penetration test is carried out to determine the consistency or hardness. To this end, a sample is subjected to the impression of a weighted standard needle for a specified time at a specified temperature. The penetration of the needle is then recorded on a dial of the penetrometer.

The buyers of petroleum asphalt usually specify the proportion of petrolene and asphaltene which they desire in the product, and these specifications depend upon the use to which the asphalt is to be put. The petroleum spirit extraction is first conducted and the carbon disulphide extraction is then made on the residue.

STEARIN PITCH

In the meat packing industry this material is otherwise known as "candle pitch" or "candle tar." It is obtained as a retort residue in the manufacture of distilled fatty acids. In modern soap manufacture it is customary to first separate the valuable glycerol (glycerine) from the tallow or the vegetable oils. The remaining part of the oil or fat is the fatty acids. In order to obtain them in a state of relative purity they are distilled, preferably in vacuum retorts.

In certain cities the recovery of grease from kitchen garbage has been introduced. The grease expressed from garbage is very dark-colored, and the fatty acids split off from the grease are likewise rather dark-colored, so that they must be distilled two or three times in order to obtain the crisp, white, stearic acid of commerce. The pitch which remains in the retort as a residue will have a melting point anywhere from 50 to 100 degrees C., and will contain appreciable amounts of saponifiable matter. This is in fact the characteristic of the pitch obtained from the fatty acid refineries. The ash or non-volatile mineral matter will be less than 5 per cent, and the matter soluble in carbon disulphide

may run as high as 85 per cent. The specific gravity of this stearin pitch will average 1.000 specific gravity.

It has been found to be impractical to produce these pitches in such grades that the melting point would be about 150 degrees C., as the material in the stills is decomposed at a point far below that temperature. One of the unique applications of stearin pitch has been in the manufacture of rubber-coated fabrics. Coal-tar pitch if used alone would give a coating too brittle for practical purposes, but if a certain percentage of stearin pitch be used in the compound, this objection is overcome and the whole compound can be worked out without much difficulty.

LABORATORY TESTS

The laboratory tests used to determine the fitness of these materials for use in rubber compounding include a determination of: (1) the melting point; (2) penetration of a needle point; (3) non-volatile mineral matter; (4) matter volatile below 290 degrees F.; (5) specific gravity; (6) free carbon; (7) fixed carbon; (8) matter soluble in various organic solvents; (9) saponifiable matter.

LABORATORY METHODS OF TESTING

1. MELTING POINT (BY THE BALL AND RING METHOD). A ring of metal, 6 millimeters thick and 16 millimeters in diameter is filled to the level with solid asphalt. This can be done by filling the ring rounding full with asphalt, cooling in cold water for a few minutes, and then cutting off the excess with a hot knife. There shall be no air bubbles inside the ring. A steel bicycle ball 10 millimeters in diameter, weighing 5 grams, is then placed in the center of the asphalt. The ring is hung on a level with the mercury bulb of a thermometer, the point being immersed in a beaker of water. For asphalt pitches melting below 50 degrees C. the water should have a temperature of about 5 degrees C. at the start. For pitches melting below 65 degrees C., about 20 degrees C. at the start. For pitches melting above 65 degrees C., about 25 degrees C. Heat the water and beaker at the rate of about 5 degrees C. per minute. Note the temperature at which the ball and pitch begin to drop rapidly on leaving the ring. This is usually about one centimeter below the bottom of the ring. This temperature is recorded as the melting point or "dropping point" of the pitch.

MELTING POINT (BY THE CUBE METHOD). This method was developed in the year 1900 to be used on coal-tar pitches. It is not well suited to pitches of the type of stearin pitch, which are tacky, slimy or sticky at the point of melting. Cubes of pitch are made in a mold having a hole one centimeter square. A beaker of about 600-cc. capacity is used. The cube of pitch is suspended by means of a wire, so that it is exactly 2 cm. from the bottom of the beaker. The water is heated by a Bunsen burner at the rate of about 5 degrees C. per minute. For high-melting-point pitches the water is replaced with glycerol, cotton oil, or calcium chloride solution. When the cube of pitch drops and just touches the bottom of the beaker, the temperature of the surrounding liquid is noted, and this is recorded as the melting point (by the cube method). The thermometer should be so placed in the beaker that the bottom of the mercury bulb is on a level with the cube of pitch.

2. PENETRATION. The consistency or hardness of pitch can be determined by noting how far a point or surface of an instrument will penetrate the pitch, provided the indenting object has a definite weight, the pitch has a definite temperature, and the point or surface is allowed to act on the surface of the pitch for a given number of seconds. The instruments used for this test are designated as penetrometers, and different types have been devised by Dow, and Bowen, and Richardson. This apparatus must not be confused with the plastometer, which is used to measure the extent to which a small flat or hemi-spherical surface will deform a substance which offers elastic resistance. The plastometer can be used on vulcanized rubber goods.

3. NON-VOLATILE MINERAL MATTER. The ash contained in pitches varies from about one per cent in pitches of hardwood, coal-tar and petroleum, to five per cent in stearin pitch and 22 per cent in Venezuela asphaltums. For making the test, a piece of asbestos ⅛-inch thick is provided with a hole large enough to take a porcelain crucible. The pitch is weighed off in the crucible and the mass is ignited with a small blue flame.

4. MATTER VOLATILE BELOW 290 DEGREES F. As the majority of rubber compounds are vulcanized between 280 and 300 degrees F. (138 and 149 degrees C.), it is important that compounding materials should contain nothing which will volatilize below those temperatures. If a pitch has been "cut back" with a low-boiling oil, the vapors of this oil may volatilize during vulcanization and cause "blowing" or "blistering" of the rubber product. Effects such as these are very much desired in the production of sponge rubber, but for other articles they merely cause defects and products with blisters.

5. SPECIFIC GRAVITY. The weight of the pitch per cubic foot is of interest and importance to the rubber compounder, because pitches of high specific gravity will naturally increase the weight of the finished rubber product "per cubic foot." Generally, a pitch with a specific gravity of less than 1.300 will be preferred. The test may be made in water kept at a temperature of 20 degrees C. By determining the weight of a sample of about one cubic inch, in air and then in water, one can by simple arithmetic calculate the relative weight of the pitch.

6. FREE CARBON. A sample of the pitch weighing less than five grams is weighed off accurately, and placed in a Schleicher and Schill fat-extraction thimble, in the Soxhlet cup of an Underwriters' extraction apparatus. Pure toluene (toluol) is used for the extraction. The process is carried on until the major portion of the solubles has been extracted, and then the sample is extracted with coal-tar benzene. When the benzene coming from the thimble is no longer colored, the extraction is complete. The thimble is dried in a steam bath and finally in an oven at 110 degrees C., after which it is weighed.

The amount of free carbon varies all the way from one per cent in hardwood pitches to 40 per cent in coal-tar pitches. This is an item that does not appear important at first thought. Now if it were possible to offer to the rubber goods manufacturer a material which contained, say, 50 per cent of a "fine carbon," together with other substances which would not detract appreciably from the valuable physical properties of the rubber compound, such a pitch product would be of considerable interest. It would be a great step forward if "fine carbon" could be incorporated with rubber compounds while in the form of a pitch. One of the technical considerations noted by the producers of pitches has been to produce a pitch of high carbon content which would at the same time have a suitable melting point, as the pitches now being made with melting points of 300 to 350 degrees F. are not actually "high carbon" pitches.

Although benzene and toluene have been found to be the solvents best suited for determining "free carbon" in coal-tar pitch, the makers of stearin pitch usually use carbon disulphide for this test. It has in fact been observed that various solvents act differently on any one pitch, so that it becomes necessary to observe and note the action of each.

7. MATTER SOLUBLE IN ORGANIC SOLVENTS. The volatile organic liquid solvents which have been used at various times to obtain a closer knowledge of the constituents of pitches include: (1) benzene, (2) toluene, (3) xylene, (4) petroleum naphtha, (5) chloroform, (6) carbon disulphide, (7) acetone.

It will be found for example that about 92 per cent of a hardwood pitch is soluble in acetone. The matter soluble in carbon disulphide is about 85 per cent of stearin pitch and 95 per cent of Utah gilsonite. The petroleum naphtha used for extraction is that known as 85 to 90 degrees Bé. (or 0.650 specific gravity). By some chemists, the matter insoluble in the principal organic solvents is recorded arbitrarily as "free carbon," as it is a well-known fact that carbon is unaffected by practically all of the solvents.

TABLE SHOWING PROPERTIES OF THE PRINCIPAL PITCH HYDROCARBONS

	Hardwood No. S	Hardwood No. H	Stearin "S"	Stearin "P"	Stearin "M"	Asphaltum	Gilsonite	Coal-tar	Petroleum
Non-volatile mineral matter	<1%	<1%	2.8%	4.0%	4.7%	21.5%	.....	<0.5%	0.0
Loss on heating to 290° F.	.....	.....	0.8%	0.5%	0.9%	.....	.....	0.0	.....
Saponifiable matter	?	?	65.0%	15.0%	16.1%	0.0	0.0	0.0	0.0
Soluble in acetone	92.0%	50.0%	<1.0%	none	none	.....	.....	<1.0%	.....
Soluble in carbon disulphide	.....	.....	84 %	.....	.....	75 %	>90%	6 %	.....
Soluble in petroleum naphtha	.....	.....	70 %	.....	71 %	.....	.....	16 %	37%
Free carbon	1.0%	30.0%	15.8%	.....	71.0%	.....	.....	40.0%	.....
Specific gravity	1.20	1.20	1.02	1.10	0.99	.....	.....	1.35	1.12
Melting point, degrees C. (ball and ring)	80	120	60	100	109	100	160	149	<100
Penetration test, 5 seconds	.....	.....	.....	.....	0.4 mm. / 77° C.	.....	.....	.....	.....

8. FIXED CARBON. In some laboratories it has become customary to determine the percentage of "fixed carbon" in pitches. This must not be confounded with "free carbon." Free carbon is that which actually exists in the original material as elemental carbon, while fixed carbon is applied to carbon which remains after incomplete combustion of the substance. It was originally determined on coals and other fuels, and the methods used in coal analysis are used by some chemists in pitch analysis. Generally speaking, the determination of free carbon is decidedly more important than the other determination.

9. SAPONIFIABLE MATTER. This test is based on the fact that if a fat or plant oil is warmed with a solution of potash in alcohol, the fat or oil is converted into a soap. The test for saponifiable matter is carried out by means of a half-normal solution of alcoholic potash. About two grams of the substance to be tested are weighed off accurately in a suitable flask; 25 cc. of the half-normal solution are now run into the flask, and the whole is gently warmed until complete saponification has taken place. Next add 1 cc. of phenolphtalein indicator-solution, and titrate with half-normal hydrochloric acid. Now conduct a "blank test" by titrating 25 cc. of the original solution of half-normal alcoholic potash. The difference in the volume of the acid used in the two cases equals the cc. of the potash solution, which were neutralized by the substance which was tested. This is then calculated to milligrams of potash for each gram of substance originally weighed off.

In other words, the Koettsdorfer number or "saponification value" indicates the number of milligrams of potassium hydroxide required for the complete saponification of one gram of the substance. In the case of stearin pitches it is found that they generally contain from 15 to 20 per cent of this saponifiable matter. As the pitch is the retort residue from the distillation of fatty acids, the pitch naturally contains a residuum of these fatty acids and this shows up in the test as "saponifiable matter." By the very nature of the case, the other pitches do not show anything when subjected to this test.

ACTIVITIES OF THE RUBBER ASSOCIATION OF AMERICA

SUMMER OUTING CANCELLED

THE twentieth annual summer outing of the Association, which was scheduled to be held at the Seaview Golf Club, Absecon, New Jersey, was cancelled on account of the small number of members who had indicated their intention to attend. It was deemed advisable to omit this outing in the interests of economy.

MEETINGS

The Traffic Committee held a meeting July 18 at The Rubber Association offices. Matters of interest were discussed.

The Executive Committee of the Tire Manufacturers' Division met at The Rubber Association offices July 27.

At the Association headquarters, Leader-News building, Cleveland, Ohio, the regular semi-annual meeting of the Tire and Rim Association was held. There was a good attendance, and subjects of importance were discussed.

DIVISIONS AND COMMITTEES

A suggestion regarding the advisability of holding regular quarterly meetings of the Tire Manufacturers' Division as a whole, in addition to the monthly meetings of its executive committee, has been received with favor. It has been considered best, however, to postpone the first of these contemplated quarterly meetings until September. Early in that month notices will be issued designating the date, hour and location of the meeting.

RULES GOVERNING CRUDE RUBBER TRANSACTIONS TO BE REVISED

Representatives of the Crude Rubber Committee of the Association and the Rubber Trade Association of New York are attempting to harmonize the sets of rules governing their respective bodies. This is being done in an endeavor to make these rules and regulations cover more satisfactorily the prevailing conditions, and represent more truly common trade practices. A joint committee will submit recommendations to the Crude Rubber Committee and the Rubber Trade Association. Suggestions will be welcomed from other members of the Association who are not represented on these committees.

NEW RATINGS FOR USED SOLID TIRE BASES

Old metal bases upon which solid tires were mounted, and from which the tires have been removed, are now rated as sixth class in car loads, according to the new ruling of the Official Classification Committee. This rating shall apply if shipments are described as scrap metal wheel bases having value for remelting or scrap purposes only.

NEW TRANSCONTINENTAL RATES

The transcontinental railroads have reduced freight rates on crude rubber from Pacific coast ports to Chicago and St. Louis and Minnesota and Wisconsin points from $1 to 75 cents per 100 pounds, minimum carload weight 80,000 pounds. It is expected that at a later date this lower rate will also apply to Indiana and Ohio points.

OUTSIDE VALVES FOR DISK WHEELS

The Tire and Rim Association has been actively endeavoring to induce the disk wheel manufacturers to design their wheels in such a manner that tire valves will be accessible from the outside. It is thought that the necessity of inflating disk-wheel tires from the inside has resulted in under-inflation with detriment to tires and unsatisfactory service.

SUMATRA RUBBER

The report for the year ended August 31, 1920, of The United Serdang (Sumatra) Rubber Plantations, Limited, gives the rubber crop harvested at 3,789,951 pounds against an estimate of 3,366,000 pounds and a previous year's total of 3,084,945 pounds. The average net sale price, including unsold portion of the crop, was 1*s.* 10.93*d.* a pound. The cost of production, f. o. b. port of shipment, including provision for depreciation, etc., but excluding loss on exchange (of 24*d.* a pound), was 1*s.* 2.22*d.* a pound. At the commencement of the year 789,372 trees were being tapped, this number being decreased, owing to thinning out and resting, to 771,791 by the end of August, 1920. The crop was harvested from an average bearing area of 9,640 acres, and the average yield was at the rate of 4.82 pounds a tree or 393 pounds an acre.

New Machines and Appliances

A NEW TIRE-BUILDING CORE

The Giant "Time Saver" is the newest development in tire-building cores used for building the tire and removing it preparatory for the air-bag and final cure. According to the old method when the tire was completed on the core, it required three or four men approximately 15 minutes to remove the tire from the core with chain or air hoist. This operation is difficult, the tools required are clumsy and the handling of the core is a great strain on the men.

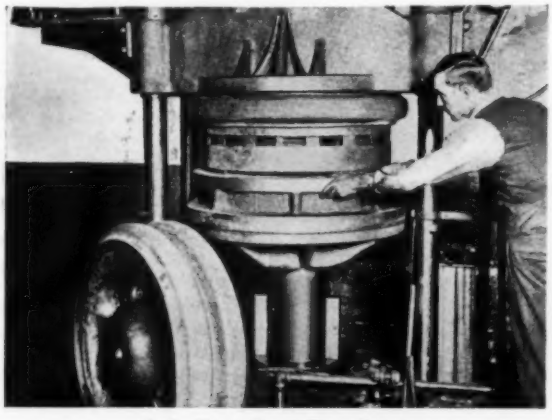
The Giant "Time Saver" Core

It is said that one man can remove any giant-sized tire from the "Time Saver" building core and reassemble it in about six minutes. The operation can be done directly on the tire building stand without removing the core.

If it is desired to build the carcass on the building machine and finish the tire on the building stand, the whole core can be transferred from machine to stand or vice-versa. The operation of fastening the core to the machine or stand requires shifting of but one lock lever that engages the face plate of the machine, or chuck to the chuck body, or core. The chuck body part of this new core is made so that any core within the range of 36 by 6, 38 by 7 and 40 by 8 sizes may be attached thereto.—De Mattia Bros., Garfield, New Jersey.

HYDRAULIC PRESS FOR APPLYING TRUCK TIRES

The press shown herewith is designed to force solid rubber truck tires, with their rims, on and off truck wheels in the most convenient, quick and efficient manner.



S. L. Type Solid Tire Press

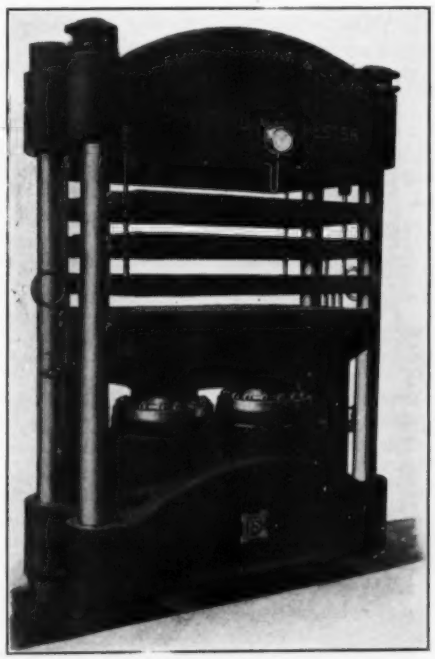
The head on this press is a solid steel casting. The base is formed by strain-rod lug extensions cast on the head of the hydraulic cylinder. Cold-rolled steel strain-rods connect the head with the base. The cylinder is of open-hearth cast steel. The pump is mounted on an extension cast on the cylinder. The circular platen is of cast steel also. It is guided by an exceptionally long ram bearing in the cylinder throat. The rams are of semi-steel outside, packed with U-leather packing which is the most convenient form to repack when worn out.

The motor, mounted on the bracket on the left side of the press, drives the pump through a belt. Direct-connected motor drive through gears can be provided if desired or the press may be equipped with a power attachment to be driven by a belt from a line-shaft.

The press may be equipped with a lifting device for inserting and removing the wheels and their tires. The hydraulic lift attached to a press will lift the heaviest truck wheel by manipulating a valve while the pump is in operation.—The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio.

HYDRAULIC VULCANIZING PRESS

A hydraulic vulcanizing press, 66 by 39 inches, specially designed for large production of rubber heels and soles, is here shown. It is operated by two 16-inch rams at one ton per square inch, giving a total pressure of 400 tons on the steam plates. The press is sunk somewhat below the floor level to render the four openings easily accessible. The molds are charged and discharged by one operator at each side of the press.



Shaw's Heel and Sole Press

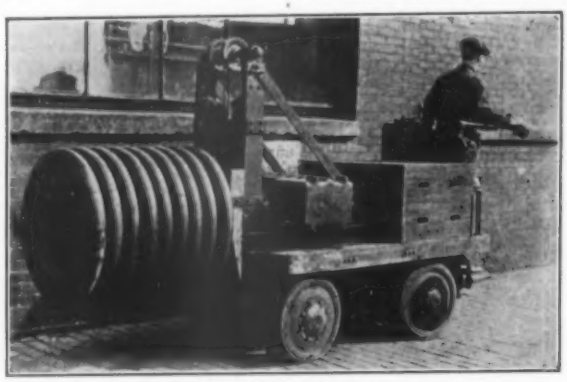
A special feature not employed on American-made presses is to be noted in the split nuts at top and bottom of the side rods. When screwed to position these are held fast by a couple of transverse bolts which pass through lugs on one side of the nut and insure its tight grip on the rod.—Francis Shaw & Co., Limited, Manchester, England.

TRUCK FOR CARRYING TIRE MOLDS AND CORES

A factory truck has been specially designed to handle tire molds and cores. By means of this new type of truck the molds, or cores, supported on a long ram, can be readily transported about the plant.

The mechanism of the truck consists of a carriage mounted on rollers, running vertically between channel guides and lifted by an electrically-driven cable hoist. The hoist motor is controlled by a small reversing switch mounted on the dash and its operation in both directions is limited by suitable switches. The truck has a capacity of 2,500 pounds, spaced evenly on the ram.

While originally designed for use solely in rubber manufacture, the truck has been found practicable in handling wire in

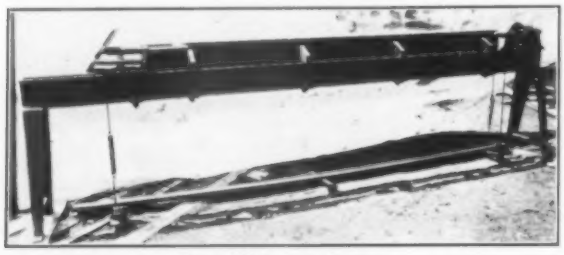


THE BAKER TRUCK

coils, for transporting rims, or any other material of this description.—The Baker R. & L. Co., 2180 West 25th street, Cleveland, Ohio.

INNER-TUBE WRAPPING MACHINE

A simple lathe for wrapping inner tubes is shown in the accompanying illustration. The base consists of two channel irons carrying the head and tail stock centers. The machine is in-



TUBE WRAPPING LATHE

tended for belt-driven operation under control of a foot-treadle. This type of machine is inexpensive but effective for its purpose.—The Banner Machine Co., Columbiana, Ohio.

A NEW TIRE-REPAIR AIR-BAG

An inflatable air-bag containing an internal device for steam-heating the compressed air is shown in the illustration. This arrangement makes it possible to use a full head of air for pressure and to immediately heat this air with the inside heating coil to the temperature best suited to the job.

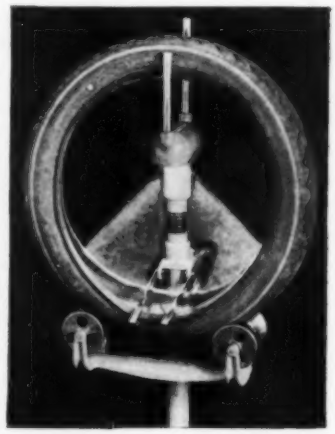
FREDD'S HEATING AIR-BAG

This method results in a better and speedier cure on sectional jobs by curing from both sides during the entire process. The steam circulates in the heating device inside the bag raising the temperature of the compressed air which in turn transmits the heat to the tire.—Fredd's Vulcanizing Plant, Hancock, Michigan.

MACHINE FOR SCIENTIFIC TIRE INSPECTION

Repair men should be sure that every tiny nail head and small break or cut have been located and that the tire is perfectly repaired before leaving the shop. Also does the factory manufacturing tires desire unquestionable inspection which will strengthen the output record of "flawless tires."

The tire-inspection machine here shown is sturdily built of metal, weighs about 125 pounds, and occupies a floor space of 15 by 24 inches. For inside inspection the tire is placed upon the two rollers and supported in an upright position by two braces. The tire is spread by pressure on the foot-lever, and a slight movement will swing the tire around in either direction upon the rollers. For tread inspection the bead rests on the two rollers and is easily revolved.



RAMSDELL TIRE INSPECTION MACHINE

In addition to making inspection scientifically accurate, tubes, reliners and patches can be quickly placed when the tire is on the machine.—The Russ Manufacturing Co., Cleveland, Ohio.

PORTABLE ELECTRIC GRINDER

While the new portable electric grinder shown herewith is of special interest to the tire-repair man and vulcanizer for roughening tires, it may be used either for a hand or a bench grinder. For the latter purpose a quick detachable base and an adjustable tool-rest are furnished. Besides the base the equipment comprises two five-inch by one-inch grinding wheels, a wire-brush wheel and a rag-buffing wheel.

PORTABLE TIRE-ROUGHENING GRINDER

The tool has pistol-grip and trigger switch which gives the operator full control over it at all times, making it unnecessary to shift either hand to start or stop it.

This grinder has several new and distinctive features and is designed after the most approved grinder practice. It has grease lubrication throughout, forced air-cooling, chrome nickel-steel gears and shafts, and aluminum alloy housing. The entire mechanism is protected from dust and other foreign matter.—Black & Decker Manufacturing Co., Towson Heights, Baltimore, Maryland.

HERMETIC AIR-BAGS—A CORRECTION

The uniform and equal expansion of the Hermetic air-bag is due to a patented method of construction whereby the air-bag is built upon an air-tight container of ring form similar to an inflated inner tube. Ordinarily, air-bags are built on straight mandrels, as are inner tubes. The result is a thick heavy splice where the ends

are brought together, that does not have the same expansion and contraction as the rest of the air-bag.

SPECIAL TIRE REPAIR MACHINES

TIRE SPREADER

It is mechanically doing the simple operations—the minute saved here and there—that in the aggregate cuts the big slice off overhead expenses. Take, for example, spreading tires to look for punctures, blow-outs, or other injuries. It is essential to do this thoroughly yet no man could inspect a tube as rapidly by hand as with the simple device shown herewith. The tire casing is placed upon the rollers on top of the stand and the hooks of the spreader-jaw envelop the bead of the tire. As the foot-lever is pushed downward, the casing is spread open for inspection.

WEAVER TIRE SPREADER

When the break has been located, the hooks carried at each corner of the auxiliary buffing plate are thrown over the bead of the casing, holding it permanently in a convenient position for repairing. The buffing plate is convex in shape and conforms snugly to the underside contour of the casing. This gives a solid backing to perform the operations necessary for vulcanizing. The wide base enables the heaviest passenger-car tire to be supported without overbalancing the spreader. It is strongly made to withstand the abuse of service, yet weighs but 70 pounds and is easily carried to any part of the shop.

UNIVERSAL TIRE CHANGER

A tire changer, invaluable to the garage or repair man, suitable for changing all sizes and styles of demountable rim tires, is here shown. Every operation in the handling of the tires and rims is done by means of smooth-finished rollers or by steady contracting or expanding pressure, without injury even in the most stubborn cases. Three heavy jaws radiate from the center and are worked by screws controlled by the crank-handle. These grip the rim and hold it securely. The horizontal arm which carries the rollers and other attachments is manipulated by hand. In position the tire rim rests within a pocket at the base of each jaw. The outer lip engages the lower edge of the rim and draws it inward, as the jaws contract, by means of the crank handle. As soon as the rim is contracted, the tire is lifted off. In remounting the tire the operation of the jaws is reversed, using an expanding pressure directed against the inside of the rim by a reverse motion of the crank handle.

WEAVER TIRE CHANGER

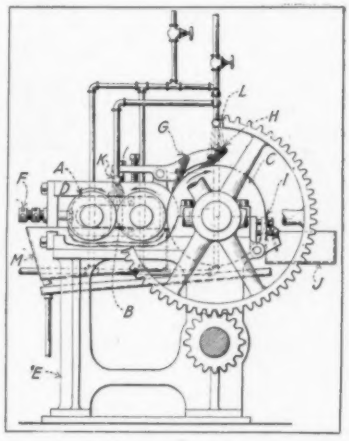
The appliance is adapted also for forcing sprung rims closed; removing lock rings and corroded tires, or mounting plain clincher tires.—Weaver Manufacturing Co., Springfield, Illinois.

MACHINERY PATENTS

MACHINE FOR CLEANING PLASTIC MATERIALS

CRUDE CHICLE and low-grade guttas used in the preparation of chicle substitute and in the manufacture of plasters and adhesive tissue always contain foreign matter that cannot be removed by an ordinary washer.

The mill here shown effects thorough cleaning of soft plastic materials by a single treatment. The machine consists of three parallel rolls *A*, *B* and *C*, set in the same plane in housings *D* resting on a supporting frame *E*. These rolls are cored and piped for temperature control and can be adjusted by screws *F*. A series of scrapers *G*, *H* and *I* adjustably contact on roll *C* for the removal of the cleaned gum which falls from scraper *I* into a receiving pan *J*.



PLASTIC GUM WASHER

In practice, water is sprayed on the rolls through the sprayer *K*, and the previously heated gum is fed between the rolls *A* and *B* where it is subjected to a stream of water. The gum adheres to the rollers and is thoroughly washed by being carried through the heated water in the pan *M*. The gum, carried by the roll *B*, is gradually transferred to roll *C* which, traveling in the direction of the arrow, carries it to the scraper *G* and under the spray *L*. Scraper *G* is adjusted against the roll *C* to prevent the passage of any but very small particles of foreign matter, thus partially cleaning the gum.

The gum is then carried by the roll to scraper *H* adjusted to leave only a minute clearance from the surface of the roll and holds up all the remaining foreign matter. A minute film of cleaned gum is left on the roll and passes to the scraper *I* which removes it and permits it to drop into pan *J*. In time all the gum passes under the scrapers and collects in the pan *J* thoroughly cleaned.—Albert Suehy, Jr., Newark, New Jersey. United States patent No. 15,060. Reissued March 8, 1921. (Original No. 1,247,173, dated November 20, 1917.)

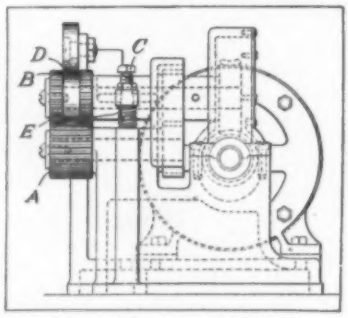
BOOTS CURED UNDER DIFFERENTIAL PRESSURE

In the manufacture of rubber boots by the differential method, the various parts are assembled upon a hollow last which is perforated at the sole, thus bringing the interior of the last into communication with the fabric lining of the boot. During vulcanization the exterior of the boot is subjected to a fluid pressure greater than that of the pressure within the interior of the last and boot in order to remove any entrapped fluid.

The effect of the differential of pressures during the heat of vulcanization may force the rubber coating of the lining through the latter and into contact with the last. The adhesion resulting greatly resists stripping the boot from the last. To obviate this there is interposed between the lining of the boot and the last a cheap, light-woven porous fabric, such as cheese-cloth, which will become incorporated into the boot structure by adhesion to the lining, and is sufficiently strong to withstand the strain necessary to pull it from the surface of the lining when desired.—John Alm and James Hughes, assignors to the Goodyear's Metallic Rubber Shoe Co., all of Naugatuck, Connecticut.—United States patent No. 1,368,682.

SHEET RUBBER PLAITING AND BANDING MACHINE

This device is designed primarily to plait the edges of thin rubber articles and to attach a band of rubber at the same time. It effectively accomplishes such work around the limb and waist openings of rubber diaper covers, although it may be used for ornamenting other articles of wearing apparel.



RUBBER PLAITING MACHINE

The machine shown in side elevation has two rollers, *A* and *B*, which coact, the former having corrugations entirely across its face, while the latter is corrugated at the edges with a plain cylindrical portion *D* between. The intermeshing gear teeth produce parallel plaits or folds and include any form which will produce a puckered or wrinkled surface.

The operator passes the articles to be ornamented between the rollers *A* and *B*, which are brought together by pressing the foot-treadle connected to the swing-frame by a rod. A pair of spur gears, which mesh together, prevents the material from being subjected to a driving strain. A narrow strip of rubber is fed between *D* and a smaller roller to insure uniform feeding without excess tension.—James William Brundage, Akron, Ohio, assignor to The Miller Rubber Co., Akron, Ohio. United States patent No. 1,371,853.

A SWISS RUBBER NIPPLE

This invention relates to a rubber nipple which is provided with an inward projecting part in which a valve slit is cut. The nipple is formed in one piece by dipping it in the usual way, with the projecting part extended outwards. It is then partially vulcanized and removed from the mold. The nipple is then turned inside out, or the projecting part is pushed inwards and the vulcanization is completed. This process is stated to prevent the valve slit opening owing to the release of the tension due to cutting.—H. Grimmelmann, Zurich, Switzerland.

OTHER MACHINERY PATENTS

THE UNITED STATES

NO. 1,379,616 Rubber-mixing machine. D. R. Bowen and C. F. Schnuck, assignors to Farrel Foundry & Machine Co.—both of Ansonia, Conn.
1,379,834 Pneumatic-tire core. F. Paulsen, Kansas City, Mo.
1,380,008 Tire-casing repair tool. H. J. Otto, Evansville, Ind.
1,380,085 Tire mold. C. L. Walton, assignor to Kelly-Springfield Tire Co.—both of Akron, O.
1,380,425 Tire vulcanizing apparatus. W. Seward, Baltimore, Md.
1,380,436 Tire spreader. O. Sundby, assignor to Sundby & Harris, East Ellsworth, Wis.
1,380,448 Tire wrapping machine. W. M. Wheildon, Ashland, and E. H. Angier, Framingham, both in Mass.; said Wheildon assignor to said Angier.
1,380,463 Tire-vulcanizing mold. G. W. Bulley, Chicago, Ill.
1,380,537 Tire core. W. R. Denman, Cleveland, O.
1,380,645 Mold for tires and tubes. H. E. Fisher, Mifflin Township, Franklin County, O.
1,380,667 Tire-building machine. R. McClenathen, Cuyahoga Falls, assignor to Kelly-Springfield Tire Co., Akron—both in Ohio.
1,380,854 Clamp for vulcanizing molds. W. Vanderpool, Springfield, O.
1,380,862 Apparatus for manufacturing seamless rubber articles, such as nipples, etc. A. Boecler, Malmö, Sweden.
1,380,919 Matrix for vulcanizers. F. Maier, Los Angeles, Calif., assignor to Western Vulcanizer Manufacturing Co., Chicago, Ill.
1,380,930 Vulcanizing air bag. G. E. Sapp, Sacramento, Calif.
1,380,966 Tire vulcanizing apparatus. A. L. Jacobson, assignor to L. A. Kearney—both of New York, N. Y.
1,381,242 Knives automatically adjustable, for use with rubber-working calenders. F. A. Schwartz, Brooklyn, N. Y.
1,381,316 Apparatus for manufacturing pneumatic tires. W. G. Lerch, Akron, assignor to The India Tire & Rubber Co., Mogadore—both in Ohio.

REISSUES

15,120 Mold for vulcanizing tires by fluid pressure. F. B. Pfeiffer Akron, O. Original No. 1,327,841, dated January 13, 1920.

THE UNITED KINGDOM

161,438 Special apparatus for making tires. Tyre Machinery Syndicate, 1 Queen Victoria street, London; H. J. Doughty, Edgewood, Providence, Rhode Island, U. S. A.
161,597 Apparatus for molding and vulcanizing tires. Dunlop Rubber Co., Limited, 14 Regent street, Westminster, and C. Macbeth, Para Mills, Acton Cross, Birmingham.
161,701 Oven for vulcanizing rubber, etc. F. O. Bynoe, 15 Chasebridge Villas, Whitton Road, Twickenham, Middlesex.
162,947 Apparatus for molding tennis balls, inflated rubber articles, etc. W. J. Mellersh-Jackson, 28 Southampton Buildings, London. (Mechanical Rubber Co., 73 Reade street, New York, U. S. A.

FRANCE

PATENTS ISSUED, WITH DATES OF ISSUE

504,706 (October 8, 1919) Apparatus for vulcanizing covers of pneumatic tires. E. Hopkinson.
505,147 (March 5, 1919) Hydraulic press for vulcanizing and shaping pneumatic tires for bicycles and motorcycles. E. Lefebvre.
505,619 (October 31, 1919) Automatic machine for manufacturing elastic fabric breadth-wise. A. Froton.
505,627 (October 31, 1919) Vulcanizing apparatus for tire repairing. J. G. Moya.
506,052 (November 14, 1919) Improvements in vulcanizing pincers. F. O. Lake.
507,975 (December 30, 1919) Machine for making plans of the material intended to be vulcanized in hot molds. The Miller Rubber Co.
507,976 (December 30, 1919) Improvements in molds for vulcanizing articles of rubber and for other purposes. The Miller Rubber Co.
508,565 (May 28, 1919.) Apparatus for the manufacture of hollow rubber goods. The Aranar Co.
508,591 (August 18, 1919) Process and apparatus for making articles of rubber. The Aranar Co.
508,674 (January 13, 1920) Improvements in rubber mixers to make them function automatically. J. J. B. A. Garabiol.
509,167 (January 27, 1920) Machine for manufacturing tires. E. Hopkinson and H. V. Lough.
509,184 (January 28, 1920) Improvements in the processes and apparatus employed in mixing or kneading rubber and similar substances. Farrel Foundry & Machine Co.
509,233 (January 29, 1920) Improvements in apparatus for the manufacture of pneumatic tires. T. Sloper.
511,136 (March 5, 1920) Improvements in portable vulcanizers for repairing pneumatic tires. Harvey Frost & Co.
511,224 (March 8, 1920) Improvements in burners for vulcanizers. Harvey Frost & Co.

GERMANY

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

778,411 (April 19, 1921) Vulcanizing apparatus with built-in alcohol-gas burner. Joh. Herrmann, Kandel, Pfalz.
779,667 (February 10, 1920) Apparatus for inserting rubber pieces in the sides of boots. Wilh. Plischewski, Kirchderne, Post Derne i. W.

PROCESS PATENTS

THE UNITED STATES

NO. 1,380,320 Producing tire-retreading matrix. E. C. Hufford, Los Angeles, Calif.
1,380,426 Vulcanizing pneumatic tires. W. Seward, Baltimore, Md.
1,380,528 Manufacture of tire mandrels. D. A. Clark and C. E. Lowe, assignors by mesne assignments to The Republic Tool & Manufacturing Co.—all of Cleveland, O.
1,380,736 Manufacture of cord tires. J. H. Patten, Kent, assignor to W. T. Behne, King County—both in Washington.
1,381,185 Manufacture of rubber nipples having valve projections. H. Grimelmann, Wallisellen, Switzerland.
1,381,654 Reclaiming rubber. E. Muschewske and W. W. Wood, Los Angeles, Calif.

THE DOMINION OF CANADA

212,201 Manufacture of reinforced inner tubes of standard size. The Liberty Tire & Rubber Co., assignee of J. A. McTaggart—both of Philadelphia, Pa., U. S. A.

THE UNITED KINGDOM

162,263 Vulcanizing tires. The Fisk Rubber Co., Chicopee Falls, assignee of T. Midgley, South Road, Hampden, and R. B. Naylor, 37 Westernview, Springfield—all in Mass., U. S. A. (Not yet accepted.)
162,528 Preserving vulcanized rubber by keeping in artificially moistened atmosphere. H. P. Stevens, 15 High street, Borough, London.

FRANCE

PATENTS ISSUED, WITH DATES OF ISSUE

504,142 (September 22, 1919) Process of making articles of rubber without solders. A. Boecler.
504,586 (October 6, 1919) Improvements in the method of applying repair bands or tread bands to used tires. C. C. Gates.
505,019 (October 17, 1919) Improvements in the manufacture of cord bodies for pneumatic tires with rods. A. O. Remy.
505,254 (October 21, 1919) Improvements in the manufacture of solid rubber tires. C. and A. E. Burnett.
508,143 (January 5, 1920) Recovering pneumatic tires by riveting. C. A. Carteret.
509,667 (April 19, 1919) Improvements in the manufacture of products with a base of rubber. A Helbronner.

GERMANY

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

779,219 (April 25, 1921) Method for improving pneumatic tires. Otto Lohr, Oberlössnitz-Radebeul.

Society of Automotive Engineers Specifications for Insulated Cables[1]

Electrical Equipment Division Report

THE Electrical Equipment Division's recommendation that the present S. A. E. standard for insulated cable be revised to conform to the accompanying specifications for insulated cable, was approved. Although the proposal does not as yet include electrical tests, it is desired by the cable manufacturers that the manufacturing specifications be adopted and published without delay so far as they have been completed.

The electrical tests for high-tension ignition cable will be included in the standard at a later date, as no entirely satisfactory tests have yet been developed. The electrical tests included in the present standard, although used considerably in general power-cable testing, are not considered satisfactory for automotive high-tension ignition cable.

The proposed revision is submitted as a practical and satisfactory specification founded on the best commercial experience. It embodies many points in common with government specifications which have been generally approved and will be used by manufacturers in producing high-grade insulated cable.

INSULATED CABLE

I. GENERAL SPECIFICATIONS

CONDUCTORS. Conductors shall be bunched or stranded as specified in each section and shall be annealed copper wire in accordance with Specification No. B3-15 of the American Society for Testing Materials. All wires shall be thoroughly tinned and must withstand the tinning test as specified in Section II, Tests. All tests of copper conductors shall be made before stranding or insulating.

COTTON SEPARATORS. Material for separators, where specified, shall be of good grade cotton and shall be closely and tightly applied.

RUBBER INSULATION. Rubber insulations shall be homogeneous in character, properly vulcanized, and placed concentrically about the conductors. Rubber insulations shall adhere closely to, but shall strip readily from, the conductors, leaving them reasonably clean. Rubber insulations used on cables covered by these specifications shall contain not less than 20 per cent (by weight) of good grade Hevea rubber which has not been previously used.

VARNISHED CAMBRIC TAPE. Varnished cambric tape shall be made from a good grade cotton fiber treated with multiple coats of insulating varnish. The instantaneous puncture voltage shall be not less than 750 volts per mil of thickness tested in accordance with the standards of the American Institute of Electrical Engineers. Varnished cambric tape shall be not less than 0.005-inch, nor more than 0.013-inch thick.

BRAIDS. Braids shall consist of closely woven cotton yarn, and shall not be less than 1/64-inch thick. Braids shall be impregnated with at least two coats of properly dried, heat, oil and water resisting insulating varnish or impregnated with black weather-proof compound which has an even and smooth finish. Adjacent layers of cable, when wound on the reel, shall not stick to one another at any temperature under 105 degrees F. (40 degrees C.).

ARMOR. Armor shall be of either galvanized or sherardized soft steel, soft brass, aluminum or copper and applied in a close helix. Successive turns shall not overlap. Armor dimensions shall be as given in Table 1.

TABLE 1. ARMOR THICKNESS AND WIDTH DIMENSIONS

	Thickness, In.			Width, In.		
Armor	Min.	Nom.	Max.	Min.	Nom.	Max.
Small	0.014	0.017	0.020	0.045	0.050	0.055
Large	0.017	0.020	0.023	0.095	0.100	0.105

Armor shall be solid "D" shaped, unless otherwise specified by the purchaser. The large armor is recommended for use on all cables exceeding ½-inch diameter underneath the armor.

II. TESTS

TINNING TEST. For this test, samples of the bare wire before being stranded or insulated shall be properly selected to secure an average grade of tinning. The wires shall be thoroughly cleansed by means of ether, benzine, gasoline, naphtha, caustic alkali solution, alcohol, or hot water and soap, whichever may be found necessary to thoroughly clean the wires.

The wires shall then be rinsed in clear water and wiped dry with a soft cotton cloth. The wires shall then be immersed for one minute in a solution of hydrochloric acid having a specific gravity of 1.088 at 70 degrees F. (21 degrees C.), and then rinsed in clear water and wiped dry as above specified. The wires shall then be immersed for 30 seconds in a solution of sodium polysulphide which contains an excess of sulphur and which has sufficient strength to thoroughly blacken a piece of clean untinned copper wire in 5 seconds.

The complete cycle of operations shall then be repeated, commencing with the immersion in hydrochloric acid and ending with the immersion in the sodium polysulphide solution.

Tests of tinning shall be made on not less than 10 sets of samples of reasonable length. All wires shall withstand one immersion in the hydrochloric acid without blackening in the sodium polysulphide solution, and 75 per cent of the wires shall withstand three immersions in the hydrochloric acid without blackening in the sodium polysulphide solution. All tests shall be conducted with the solutions at a temperature of 70 degrees F.

PHYSICAL TESTS. A test specimen of rubber insulation which has not previously been handled, not less than 6 inches long shall have marks placed upon it 2 inches apart. The sample shall then be stretched at the rate of 12 inches per minute until these marks are 6 inches apart, and then immediately released. Thirty seconds after being released the distance between the marks shall not exceed 2½ inches. The test specimen shall then be stretched until the marks are 7 inches apart before it is ruptured.

The ultimate tensile strength of rubber insulation shall not be less than 600 pounds per square inch. The tensile strength shall be calculated upon the original cross-section of the test-specimen before stretching.

Physical tests shall be made at a temperature of not less than 50 degrees F. (10 degrees C.), nor more than 90 degrees F. (32 degrees C.).

For the purpose of these tests, care must be used in cutting to obtain samples of uniform cross-section and no manufacturer shall be responsible for results obtained from samples imperfectly cut.

The above physical tests shall not apply to wires or cables having a wall thickness of less than 0.045-inch. For wires and cables having a wall thickness of less than 0.045-inch the initial and ultimate stretch shall be 5 and 6 inches, respectively, and the tensile strength not less than 500 pounds per square inch.

MISCELLANEOUS TESTS. The following tests apply to high-tension (secondary) ignition cables only.

OIL TEST FOR BRAIDED CABLES. A sample of cable shall be immersed in a mixture of equal parts of machine oil and gasoline for a period of 24 hours without allowing the ends of the sample to become submerged. After this immersion the impregnating varnish should not show signs of softening or absorption, and when the braids have been peeled off, it should be shown that no oil has penetrated to the rubber insulation.

[1]The Journal of the Society of Automotive Engineers, July, 1921. Pages 57-59.

III. SPECIFICATIONS FOR HIGH-TENSION (SECONDARY) IGNITION CABLES

Conductors shall be stranded and covered with rubber insulation.

High-tension (secondary) ignition cables shall be plain rubber covered, single braided, rubber face taped and single braided or double braided. Weatherproof braid shall not be used on this type of cable.

High-tension (secondary) ignition cable sizes shall be as shown in Table 2.

Table 2. High-Tension (Secondary) Ignition Cable Sizes

Nominal Size		No. of Wires in Strand.	Nominal Size of Wires in Strand. A.w.g.	Max. Outside Diam. Inch.	Min. Outside Diam. Inch.	Min. Thickness of Rubber Wall, In. (Plain Rubber Covered)	Min. Thickness of Rubber Wall, In. (Single Braid)	Min. Thickness of Rubber Wall, In. (Double Braid)
Mm.	In.							
7	0.2756	12	26 (0.0159)	0.285	0.265	0.097	0.081	0.066
		19	27 (0.0142)					
9	0.354	19	27 (0.0142)	0.364	0.344	0.135	0.119	0.104
		19	(0.0147)					

The 7-mm. size is recommended for all high-tension cable.

IV. SPECIFICATIONS FOR LOW-TENSION (PRIMARY) IGNITION CABLES

Conductors shall be bunched or stranded and covered with rubber insulation. Low-tension (primary) ignition cable shall be plain rubber covered, single braided, rubber face taped and single braided, or double braided. Low-tension (primary) ignition cable sizes shall be as shown in Table 3.

Table 3. Low-Tension Ignition Cable Sizes

Nom. Size	No. Wires In Strand	Nom. Size, Wires in Strand A.w.g.	Nom. Size, Wires in Strand In.	Max. Outside Diam. In.	Min. Outside Diam. In.
5 mm. (0.197 in.)	12	26	0.0159	0.207	0.187
	19	27	0.0142	....	....

V. SPECIFICATIONS FOR RUBBER-COVERED LIGHTING AND STARTING CABLES

Conductors of cables Nos. 16 to 10 A.w.g. inclusive shall be either bunched or stranded as desired. Stranded construction is recommended for flexibility. Conductors of cables No. 8 and larger shall be stranded and may be either concentric or rope lay.

Conductors shall be covered with rubber insulation.

Note—Lighting and starting cables shall be single braided, rubber face taped and single braided, or double braided.

Lighting and starting cable sizes shall be as shown in Table 4.

Table 4. Stranding and Dimensions of Llghting and Starting Cable

Nom. Size A.w.g.	No. Wires in Strand	Nom. Size Wires in Strand A.w.g.	Nom. Size Wires in Strand In.	Circular Mils Nominal	Circular Mils Actual	Contin. Carrying Cap., Amp.	Max. Outside Diam., In.	Min. Thickness of Rubber Wall, In.
	12	27	0.0142		2,418			
16	16	28	0.0126	2,583	2,557	6	0.200	0.022
	19	29	0.0112		2,407			
	19	27	0.0142		3,829			
14	26	28	0.0126	4,107	4,155	15	0.223	0.027
	19	25	0.0179		6,088			
12	26	26	0.0159	6,530	6,607	20	0.250	0.031
	19	23	0.0225		9,681			
10	49	27	0.0142	10,383	9,873	25	0.275	0.031
	19	21	0.0284		15,392			
8	51	25	0.0179	16,510	15,680	35	0.320	0.037
4	61	22	0.0253	41,741	39,193	70	0.420	0.0468
	61	20	0.0319		62,312			
2	127	23	0.0225	66,371	64,707	90	0.490	0.0468
	127	22	0.0253		81,598			
1	133	22	0.0253	83,693	85,453	100	0.600	0.0625
	127	21	0.0284		102,883			
0	133	21	0.0284	105,535	107,743	125	0.635	0.0625
	127	20	0.0319		129,731			
00	133	20	0.0319	133,077	133,817	150	0.700	0.0625
	259	23	0.0225		131,961			

VI. SPECIFICATIONS FOR VARNISHED CAMBRIC INSULATION LIGHTING AND STARTING CABLES

Conductors shall be constructed as described in Section V, and shall be stranded as shown in Table 4. Lighting and starting cables of this class shall have two or more layers of overlapping varnished cambric tape. Alternate layers shall be laid in opposite directions. Lighting and starting cables of this class may be either single or double braided.

Table 5. Additional Specifications for Varnished Cambric Insulation and Armored Lighting and Starting Cables

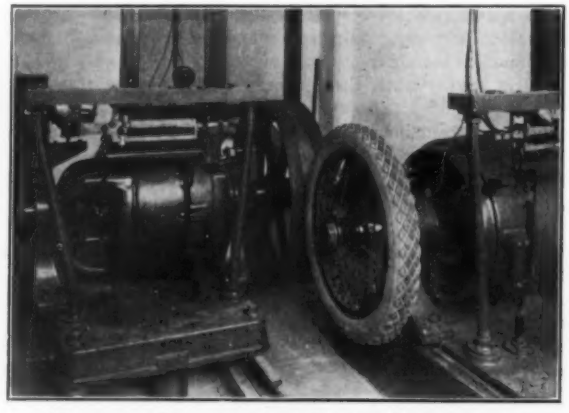
Nom. Size, A.w.g.	Contin. Carrying Cap. Amp.	Max. Outside Diam. Varnished Cambric Cables, In.	Max. Outside Diam. Armored Cables, In.
16	8	0.215	0.255
14	18	0.229	0.269
12	22	0.249	0.289
10	27	0.273	0.313
8	45	0.298	0.338
4	80	0.383	0.423
2	110	0.450	0.496
1	140	0.530	0.576
0	180	0.570	0.616
00	210	0.629	0.675

VII. SPECIFICATIONS FOR ARMORED LIGHTING AND STARTING CABLES

Conductors shall be constructed as described in Section V and shall be stranded as shown in Table 4. Lighting and starting cables of this class shall have two or more layers of overlapping varnished cambric tape. Alternate layers shall be laid in opposite directions. Lighting and starting cables of this class may be either single or double braided.

BUREAU OF STANDARDS ANALYZES PNEUMATIC TIRES

The Bureau of Standards, Washington, D. C., is carrying on an interesting series of investigations in order to develop a standard specification for pneumatic tires. A tire-testing dynamometer has been installed with a view to determine the amount



Bureau of Standards Tire-Testing Dynamometer

of energy dissipated in heat in tires operated under different conditions of axle load, inflation pressure, speed in miles per hour, and tractive effort. By means of this machine the pressure of the tire against the wheel with which it is in contact may be measured.

In analyzing various brands of automobile tires, the Bureau of Standards makes use of what is scientifically termed an accelerated aging test. During a year, for instance, "the Rubber Section of the Bureau of Standards analyzed for the War Department more than 500 samples of rubber, representing 250,000 tires, and having a valuation of $20,000,000."

As a result of these tests valuable assistance has been rendered to rubber manufacturers, while the quality of rubber compounds has been greatly improved.

New Goods and Specialties

LETTING THE DEALER DO HIS SHARE

RECOGNIZING that a nursing-nipple bored for milk only cannot be used for prepared infant food, the manufacturer of the "Sanitate" nipple has provided means for the dealer or druggist to bore the nipple with a hole of the proper size. The nipple is made in one piece with a long, slender extension at the top which becomes inverted when the nipple is turned the other side out, and prevents collapse of the nipple. This extension is grooved for boring for a hole of any desired size, and the druggist or dealer gets an opportunity to cooperate by boring a hole of the right size to meet the customer's particular requirements.—The Miller Rubber Co., Akron,

SANITATE NIPPLE

"SPIRALWEAVE" PORTABLE CABLES

A new device in cable manufacture is offered by a well-known Wilkes-Barre company, whose wire products have been on the market since 1848.

The peculiar feature of the "Spiralweave" cables is the method of weaving the outside covering. The threads lie so as to counteract all pull and surface abrasion. Made like fire hose, "Spiralweave" cables are said to outwear other makes that so often have a tendency to stretch and bulge. They are particularly fitted for use as mine-shaft cables; the warp threads running lengthwise of the wire directly support the cable and no steel supporting wires are then necessary.

The heavy insulation, of carefully prepared and combined material and proper rubber vulcanization, gives these cables full protection against moisture or sulphur water. "Spiralweave" can often be used in place of lead-covered cables where there is danger of electrolysis.—Hazard Manufacturing Co., Wilkes-Barre, Pa.

WATERPROOF WADER

ENGLISH TYPE OF CHILDREN'S WATERPROOF WADERS

From England comes a practical wader for children on the beaches, in the form of a waterproof garment which mothers will undoubtedly appreciate. This garment, which is fashioned to protect a child from moisture and dirt, and which is of particular use at the seashore, is made up of a trousers portion combined with a bodice, the whole fastened with straps, and easily put on or removed. A particular feature is the tongue insert at the back of the bodice, preventing the entrance of water. Buttons form the means of fastening this tongue into place, but do not show in the picture.—Pawsons & Gillett, 19 Chapel street, Milton street, London, E.C.2, England.

ATTRACTIVE BATHING CAPS

The "Cleopatra" bathing cap is circular in shape, with pleated top effect and round disks set in at the sides, trimmed with daisy and tassel ornaments. It is to be had in flesh, blue, bright red, yellow, green, and white, trimmed in contrasting colors, and decorated with a design of clusters of dots.

The "Jewel" bathing cap is meant for diving and has only a decorated bow on the front and sides ornamented with "jewels." This cap comes in flesh, green, black, bright red, and blue with trimming and head-band to harmonize.

The "Hawaii" cap has a tam-shaped top overlaid with wide fringe formed by loops of rubber in contrasting color to the body of the cap which may be flesh, green, blue, bright red, or yellow.

"CLEOPATRA"

"JEWEL"

"HAWAII"

The close-fitting head-band is of the same color as the fringe.

These bathing caps are carefully manufactured from tested rubber stock. While the manufacturer cannot assume responsibility for deterioration caused by light, heat, or climatic conditions, these caps are said to be as nearly proof against light, sun and climate as a thin rubber article of light weight and high grade can be.—The Faultless Rubber Co., Ashland, Ohio.

A SPORTS SHOE OF NEW DESIGN

Several new types of sports shoes which would seem to have a particular appeal during summer and for summer sports are offered by the Hood Rubber Products Co., Inc. Among these is the "KlayKort," a tennis shoe made of white duck and having red trimmings. The sole is of red rubber, while the forepart of this sole is of extra quality gray pebbled rubber. The toe cap is also of rubber, while there is a thick felt cushion between the sole and the sock lining. This shoe is suitable not only for tennis but for all outdoor purposes and is made in sizes for men, boys, youths, and women. — Hood Rubber Products Co., Inc., Watertown, Massachusetts.

"KLAYKORT" TENNIS BAL

"AUTCO-KECK" SAFETY BOOT

The special advantages of the "Autco-Keck" safety tire boot are said to be that it can be used to repair a rim cut without causing the casing to bulge, as well as for a blow-out. There are no flaps to project over the edge of the rim, and it is easily applied. It was formerly made by the Keck Manufacturing Co., West Unity, Ohio, and is the invention of Herbert C. Keck.—Akron Universal Tire & Rubber Co., Medina, Ohio.

WATERPROOF HAT-PROTECTOR FOR MEN

A useful invention recently put on the market is a waterproof hat-protector, designed to shield a man's hat from rain or snow. The covering for the crown is of waterproofed cloth or thin sheet rubber, and comes in three styles, suitable for the three ordinary types of men's headgear. The Newman hat-protector follows the contour of the hat and turns under the brim, where an elastic band in the hemmed edge draws the covering for the brim into shape. The device would seem to have much in its favor. To find a protection for women's hats, to suit the many varying shapes and styles, would be, however, a more difficult matter.

NEWMAN HAT-PROTECTOR

When not in use the protector can be folded up compactly, but is easily applied when needed and is held securely in place.—Manufacturers Engineering Co., 520 Fifth avenue, New York, N. Y.

RUBBER SANITARY NAPKIN COVER

The "Crescent" sanitary napkin cover is made in tubular form, of white rubber of good quality. The edges of the oval opening cut in one side to permit the insertion of a napkin are reinforced by rolling, as are also the open ends of the cover through which the ends of the napkin are slipped. Gripping fasteners just inside these open ends hold the napkin in place after the cover has been adjusted. These fasteners are riveted in place over pieces of white felt between them and the rubber. This cover may be worn with any belt preferred, and makes it unnecessary to wear a sanitary apron or other similar protection. After washing with any pure soap, it should be patted dry with a towel and dusted with talc powder before being put away.—Crescent Specialty Co., Inc., 265 Wyckoff street, Brooklyn, New York.

"CRESCENT" SANITARY NAPKIN COVER

NEW LINE OF RUBBER HOSE

The "Conqueror" line includes air hose, wash rack hose, and flexible hose nozzles. The hose, with a white stripe as its distinguishing characteristic, has, it is claimed, many important features. Among these are unusual durability, the fact that it can withstand several hundred pounds' pressure, and that it is "non-kinkable". The "Conqueror" air hose is put up in fifty-foot coils, or, if desired, in 500-foot continuous lengths.—Voorhees Rubber Manufacturing Co., 20-56 Bostwick avenue, Jersey City, New Jersey.

"CONQUEROR" HOSE

RUBBER-TOP MOUTH FOR TOBACCO BAGS

George W. Williams has improved upon the construction of his prior patent, and now offers a self-closing mouth-piece comprising a conical neck having at its larger end a flange adapted to lie within the discharge opening of bags for tobacco or other granular matter. At the opposite end of the neck are a pair of lips, the meeting faces of which are straight and of such thickness and contour that in normal position they form a closure for the mouth-piece. At the opposite end of the neck are ribs having the double function of retaining the mouth-piece in the opening of the bag and of assisting in effecting the automatic closure of the mouth-piece after it has been opened. The draw-string of the bag is caught beneath the ribs, and, if too long, can be wound around the neck piece and caught under the ribs. When the neck is deformed by pressure at its opposite ends, the lips separate outwardly, bringing the ribs against the bag mouth at a point where it is supported by the flange. Thus the ribs act as resilient struts which assist the normal resiliency of the neck in returning the lips to closed position after deformation.—George W. Williams, 1663 Bay Ridge avenue, Brooklyn, New York.

TOBACCO BAG MOUTH-PIECE

NEW TYPE OF GOLF SOLE AND HEEL

In place of the old-time spiked shoes which are now being banished from golf courses, a new type which, it is claimed, grips as securely but does not injure the golf green, has appeared. The "Steady Man" soles and heels can be attached to ordinary walking boots. The soles are of high-grade red fiber-rubber, to which has been added, before vulcanization, a special ply of white tread compound to form a wear-plate studded with truncated cones which are an integral part of the sole. The shoes equipped with these aids would seem to meet the approval of golfers.—Stedman Products Co., South Braintree, Massachusetts.

"STEADY MAN" SOLE AND HEEL

STAGGERED BLOCK TIRE

A new type of tread for solid tires, called "Staggered Block," which has, it is said, given very satisfactory results in severe

STAGGERED BLOCK TIRE TREAD

trials, and for which a patent has been applied, aims to give a truck greater speed, as well as to effect a marked saving in gasoline. Some of the advantages claimed for this design and construction are that a more uniform cure can be obtained in manufacture, less internal heat is generated while in use as the tire is semi-air cooled, the traction wave is practically eliminated, and greater traction and resiliency obtained through more rapid displacement. The design is such that it is an individual block tire, each block set alternately on a permanent hard base.—H. H. Boucher, 1308 West Pico street, Los Angeles, California.

A RUBBER BOTTLE-CONTAINER

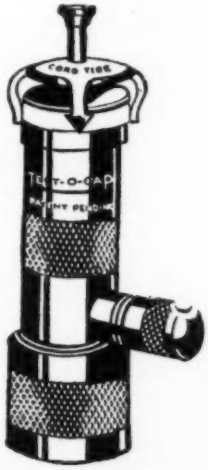
The accompanying illustration shows a new bottle-holder or container, which may be made of rubber, rubberized fabric, or rubber compounds. It may be decorated in any way desired, by using colored rubbers, and it may be in any shape or size to fit bottles of different kinds. The sides are corrugated to prevent rolling if it happens to tip over, but there is an extending flange at the bottom which forms a small air chamber or vacuum when the holder is placed firmly on a flat surface, and this vacuum helps hold the bottle and cover in an upright position. The open end is finished with a heavier band of rubber which grips the bottle firmly. This device is intended to minimize the cracking of bottles from shock as well as to prevent light from getting at their contents, and to preserve heat and cold in contained liquids.—Mrs. Catherine Flannery, 16 Hakes avenue, Hornell, N. Y. United States patent No. 1,381,071.

NURSING-BOTTLE HOLDER

DUST CAP AND TIRE GAGE COMBINED

An ingenious invention that combines the features of a dust cap and pressure gage for tire-valve stems is the "Test-O-Cap," which, it is claimed, saves time, tires and gasoline.

The cap screws on over the valve stem and is adjustable to the required pressure. Its functions are to guard against either under or overinflation and in order to test the pressure it is necessary only to press a small plunger at the top. If the cap rises the tire is properly inflated. If it rises so far that a projecting arrow-point travels above the bottom edge of a red band that circles the cap, the tire is overinflated. Failure of the cap to rise at all signifies underinflation. At one side of the cap is a connection for the pump hose.—The Greist Manufacturing Co., New Haven, Connecticut.



THE "TEST-O-CAP"

"2-PLEX" INSULATING TAPE

Under the name "2-Plex," a combination rubber and friction tape for use in electrical insulation is being marketed. This tape is made with about 50 per cent of live rubber, the rubber side being red and the friction side black. It will withstand a heat of over 200 degrees F., it is claimed, without crystallizing or vulcanizing. This tape is ¾-inch wide, is put up in ½-pound rolls, and comes wrapped in heavy tinfoil.—Diamond Holfast Rubber Co., Atlanta, Georgia.

SCIENTIFIC NURSING-BOTTLE NIPPLE

The "Dominion Nurser" has a special holdfast, anti-colic feature in the shape of the lower part which fits inside the neck of an eight-ounce, round, graduated bottle with semi-wide neck, and allows a passage of air between the nipple and the neck of the bottle while the child is feeding. The nipple also has a projecting flange about half way up from the bottom, which covers the top of the bottle and prevents the food from leaking out. If babies could express their opinions, doubtless they would give this invention their unqualified approval.

To remove the nipple from the bottle it is only necessary to insert the finger and thumb below the middle flange, pressing the nipple together slightly and letting in the air. It will then come out easily and can be readily cleaned. The manufacturer of this red rubber nipple also puts out the special bottle on which to use it, and this bottle, on account of its wide neck, can be readily washed and kept entirely antiseptic by proper scalding.

"DOMINION NURSER"

NEW "FLEETFOOT" SANDAL

The "Romper" barefoot sandal is a two-strap model of the "Fleetfoot" line, made of white duck, with leather insole and counter, white rubber sole and white foxing, and is made in sizes for misses and children. The same manufacturer produces both nipple and sandal.—Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada.

"ROMPER," FLEETFOOT LINE 2-STRAP SANDAL

CORD TIRE FROM THE MID-WEST

The "Black Hawk Chief" cord tire is said to possess many refinements over the ordinary cord tire. Its outside dimensions are larger than standard cord tires and it is heavily reinforced at the rim to prevent cutting. The side-walls are protected by an unusually heavy coat of tough rubber which prevents the scuffing so common to cords.

The several types of pneumatic automobile tires manufactured by this company are guaranteed to be free from imperfections in material and workmanship. Out of 15,000 manufactured only twenty-two were returned for adjustment. The company claims that its tires are built for hard usage, and have been proved equal to the emergency when used on rough country roads.

The same manufacturer also is featuring "Black Hawk Sturdy Traveler" inner tubes of red rubber with a wide jet-black stripe of specially toughened rubber around the tread. It is claimed that this tube cannot rust to the rim.—Black Hawk Tire & Rubber Co., 2028 East Walnut street, Des Moines, Iowa.

"BLACK HAWK CHIEF" CORD

THE REED RUBBER CO., 1156 DORR STREET, TOLEDO, OHIO, IS marketing toy balloons in sealed white envelopes on which is printed in colors a group of youngsters "flying" balloons.

THE OBITUARY RECORD

PROMINENT RUBBER JOURNALIST AND PLANTING AUTHORITY

THE career of William F. de Bois Maclaren, of Armadale, Scotland, Dumbartonshire, recently terminated at the age of 64, was notable for scope and accomplishment. Although known generally as a financial pioneer of the rubber planting industry, Mr. Maclaren first made his mark in the field of trade journalism. He successfully developed a small printing office into a publishing company of international character, establishing one by one a series of successful trade journals, among them *The India-Rubber Journal*, of London.

He was among the first to see the possibilities of the rubber plantation industry, to the development of which he devoted much skill and direction. To him and others this industry owes a tradition of clean finance and skilled management. He made himself an authority on rubber planting and his views on the subject were highly esteemed. As a business man he is credited as cautious, yet courageous. He was versatile in attainments, full of wit and humor, a ready speaker and a kind-hearted man.

POPULAR IN THE WEST

Charles Measure, formerly connected with The Goodyear Tire & Rubber Co., and more recently with the Federal Rubber Co., Cudahy, Wisconsin, died June 27 at his home in Milwaukee, after a brief illness. Mr. Measure had devoted his entire business career to the rubber industry, and was a salesman of wide acquaintance and experience. He became associated with the Federal Rubber Co. in 1912, and at the time of his death was manager of mechanical rubber goods sales. Mr. Measure is survived by his widow, one son and a daughter.

EDITOR'S BOOK TABLE

"INDUSTRIAL DEMOCRACY AND THE BETTER BOSS." By James Cooper Lawrence, director of branch operations of The B. F. Goodrich Co., Akron, Ohio. Reprinted from "Administration—The Journal of Business Analysis and Control," New York City. Fifteen pages, 4 by 6 inches. Distributed gratis by The B. F. Goodrich Co.

A COMMON-SENSE view of labor conditions, and an explanation of the underlying motive of the widespread unrest among many workers in large industries. The author recognizes in the worker a natural craving for leadership exemplified in labor organizations, but ignored in their various "industrial democracy" schemes, despite the fact that leadership has proved itself indispensable in all human activities. It is not merely a voice in the management that the worker really needs so much as capable leadership, which will insure him good working conditions, good wages, and a good home.

The author sees in the present era of slackened production the chance of a generation to purge from industrial organizations leaders who have proved their inability not merely to get results for a plant but to handle fairly the operatives over whom they are placed. He notes with satisfaction the tendency of many corporations to encourage the sale of common stock. The employes thus share in the ownership of the business.

"TRADE TESTS, THE SCIENTIFIC MEASUREMENT OF TRADE Proficiency." By J. Crosby Chapman, B.A., D.Sc., Ph.D., with the assistance of Daisy Rogers Chapman, M. A. Henry Holt & Co., New York, 1921. Cloth, 435 pages, 5½ by 8¼ inches.

This book treats of trade test methods developed by the Committee on Classification of Personnel, Army Trade Test Division. The trade test is the instrument devised and constructed to make it possible for a trained examiner, unskilled in any particular trade, to measure in objective terms the trade standing of any recruit claiming skill in any of the several hundred trades necessary to the work of the Army.

The construction and application of the oral, picture, performance and written tests are detailed. The place of the trade test in industry is discussed at length, followed by a bibliography and index.

"AMERICAN CHEMISTRY: A RECORD OF ACHIEVEMENT THE Basis for Future Progress." By Harrison Hale, Ph.D., head of Department of Chemistry, University of Arkansas. D. Van Nostrand Co., 8 Warren street, New York, N. Y. Cloth, 215 pages, 6 by 8½ inches.

In the preface to this volume attention is called to the steadily increasing importance of a knowledge of chemistry, because of the connection this subject has with matters of every-day life. The record of the American chemist, the author believes, is one of achievement, with encouraging prospects for still further progress. In the volume under consideration a chapter is devoted to briefly describing rubber from source to finished product, while several illustrations serve to give the subject an added interest. A brief bibliography appears at the end of the chapter.

NEW TRADE PUBLICATIONS

IN THE INTRODUCTION TO THE RECENT CATALOG ISSUED BY FRANCIS Shaw & Co., Limited, Bradford, Manchester, England, the following sentence is significant: "As the leading makers in Great Britain of rubber machinery our designs can be relied on to include all up-to-date improvements and labor-saving devices."

The catalog at hand is divided into several sections, each dealing with some division of the rubber industry. More exhaustive treatment, however, of the subjects mentioned can be found in other circulars published by the same company under the titles of: "Rubber Plantation Machinery"; "Machinery for the Manufacture of Solid and Pneumatic Tires"; "Fine Cut Sheet Machinery"; and "Vacuum Drying and Impregnating Machinery."

The most important sections of the present catalog deal with types of rubber plantation machinery and machines for making tires, belting, hose, and many kinds of mechanical goods. Descriptions of machinery used in vulcanizing are also given an important place. Many illustrations serve to give added interest to this catalog.

THE FISHER GOVERNOR CO., MARSHALLTOWN, IOWA, IN ITS recently issued Bulletin No. 210 sets forth the advantages of the series No. 90 pressure regulator, manufactured by this firm. The single-seated self-contained pressure regulator in question is particularly adapted to vulcanizing, and can be used where lack of space prevents use of lever and weight type of valve. The mechanism is of especial value, it is claimed, in controlling the vulcanizing steam pressure and is being used in many plants devoted to the manufacture of rubber products.

THE ADAMS-BARRE CO., 1242-1244 NORTH HIGH STREET, Columbus, Ohio, in its Catalog No. 21, recently issued, calls attention to the advantages of its tire repair equipments. A comprehensive list of vulcanizing tools and supplies is one of the important features of this catalog.

THE FIRM OF TOCH BROTHERS, 320 FIFTH AVENUE, NEW YORK, N. Y., publishes numerous catalogs descriptive of the company's various "RIW" protective products. The rubber colors which this company manufactures include blacks, reds, yellows, blues, greens, etc., of use for coloring tiles, hot-water bottles, automobile tubes, toy balloons, and rubber goods of all kinds.

IN AN EFFORT TO INCREASE THE USE OF THE MOTOR TRUCK AS an indispensable factor in modern transportation, the Firestone Ship-by-Truck Bureau, Firestone Park, Akron, Ohio, has issued a series of bulletins devoted to this subject. The most recent of these, Bulletin No. 8, is entitled "Marketing Live Stock by Motor Truck." By means of photographs, charts, and statistical tables an investigation covering movements into Omaha, St. Joseph, Kansas City, Denver, Fort Worth, Cincinnati, Indianapolis, East St. Louis and other cities, has been reported. The bulletin aims to show the part that the truck has been and is playing in the marketing of live stock, and to point out some of the benefits resulting to the farmer from its use.

"THE BLACK ART OF RUBBER COMPOUNDING," CHAT No. 6. The sixth in the series which is being sent out to the trade by the Binney & Smith Co., 81 Fulton street, New York, N. Y. It deals with Micronex as an ingredient in tire and shoe stocks and in pressure-cure formulas.

AMONG THE NEW PUBLICATIONS WHICH ARE OF INTEREST TO THE rubber industry is an illustrated pamphlet issued by Harrisons & Crosfield, Limited, 1-4 Great Tower street, London, E. C. 3, England. This pamphlet, entitled "Rubber, Tea and Other Tropical Produce," furnishes much valuable information regarding the commodities mentioned. Several statistical tables add much to the importance of the pamphlet.

AN UNUSUAL AND INTERESTING CATALOG IS THAT OF THE Spreckels "Savage" Tire Co., San Diego, California. The author and illustrator of this circular is a full-blooded Indian, brought up among his own people, the Apaches, but later trained in the white man's universities. The catalog sets forth not only some of the curious Indian customs but describes also the important features of the new "Savage" cord tires, the latest product of the Spreckels company.

RUBBER TRADE INQUIRIES

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(893) A manufacturer requests the address of a New York concern handling talc under the brand "600."

(894) Request is made for the address of the manufacturer of brown and gray good-quality rubber bathing caps having the edge machine-stitched to resemble button-holing, and fastening under the chin with adjustable strap.

(895) The address of manufacturers of uncoated fabric for dirigibles is desired by a reader.

(896) A manufacturer desires the address of concerns manufacturing machinery for plaiting and crimping sheet rubber.

(897) A manufacturer abroad requests the address of makers of rubber drives suitable for motorcyclists.

(898) A reader asks for the address of the manufacturer of a green felt top rubber-base dice mat, 18 by 24 inches.

(899) A reader in Japan requests the addresses of manufacturers of rubber footwear repair equipment and supplies.

(900) An inquiry has been received for the addresses of manufacturers of knit jacket fire hose.

(901) A reader desires to know what rubber specialty house uses OO as the trade mark on its products.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.	COOPERATIVE OFFICES.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building.	Dayton, Ohio: Dayton Chamber of Commerce.
St. Louis: 402 Third National Bank Building.	Los Angeles: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Philadelphia: Chamber of Commerce.
San Francisco: 307 Customhouse.	Portland, Oregon: Chamber of Commerce.
Seattle: 848 Henry Building.	

(34,911) A merchant in Porto Rico desires to secure an agency for the sale in Spain of tires and accessories.

(35,085) A commercial agent in France desires to secure the representation of firms for the sale of tires and accessories.

(35,105) A mercantile firm in Catania desires to purchase first-grade automobile tires and pneumatic tires. Correspondence in Italian.

(35,133) An importer in Spain desires to be placed in communication with manufacturers not already represented in that country, for the sale of rubber heels, automobile and motorcycle accessories, etc.

(35,153) A company of commission agents in the Maltese Islands desires to secure an agency for the sale of raincoats. Quote c.i.f. Malta for shipment direct from New York to Malta.

(35,199) A merchant in Spain, now in the United States, desires to purchase and secure an agency for the sale of novelties and rubber goods.

JUDICIAL DECISIONS

SUIT BY I. T. S. RUBBER CO. VS. ESSEX RUBBER CO. DISMISSED

I. T. S. RUBBER CO. VS. ESSEX RUBBER CO. District Court, District of Massachusetts, November 27, 1920. In Equity, No. 1008.

THE case in question had reference to an alleged infringement of the Tufford patent on resilient heels, No. 14,049, reissued January 11, 1916. On the defendant's motion to dismiss this suit, brought by an Ohio corporation against a New Jersey corporation, on the ground that it appears on the records that there was no infringement in the district mentioned, the motion was granted and for want of jurisdiction the bill was dismissed.—*Federal Reporter*, volume 270, pages 593-656.

COMPLAINT AGAINST SUPER TREAD TIRE CO. DISMISSED

Following the recent report of the Union Trust Co., receiver for the Super Tread Tire Co., South Bend, Indiana, the case of the Federal Trade Commission against the latter concern has been dismissed.

No evidence was found to substantiate the claim that the Super Tread Tire Co. ever "sold rebuilt tires with the intent, purpose and effect of deceiving and misleading the general public, or that said company circulated or caused to be circulated advertisements which stated that the Super Tread Tire Co.'s automobile tires were new, when, as a matter of fact, they were reconstructed and rebuilt."

It was also found that this company in its advertising matter, when offering its tires for sale, never concealed the fact that such tires were rebuilt. The case against the company was therefore set aside.

CUSTOMS APPRAISERS' DECISIONS

The United States General Appraisers, New York, N. Y., affirmed the decision of the collector in the matter of the protest of Austin Baldwin & Co., Boston, Mass., against the assessment of duties on printers' blankets by the Boston collector of customs.

Printers' blankets composed of three layers of rubber and three layers of cotton, were assessed for duty as a manufacture in chief value of cotton, at 30 per cent ad valorem under Paragraph 266, Tariff Act of 1913. It was claimed by the importers to be a manufacture in chief value of rubber, with duty at the rate of but 10 per cent ad valorem under Paragraph 368.

THE EDGE LAW AMENDED

The bill amending the Edge Act, which has become law by presidential signature, provides that after the required initial payment on subscriptions to the capital stock of Edge Law corporations, subsequent payments, with the consent of the Federal Reserve Board, may be made upon call of the board of directors of such corporations. It is believed that this amendment, doing away with the 10 per cent installments at sixty-day periods formerly required, will greatly facilitate obtaining subscriptions by giving assurance that funds will be acquired only as urgently needed for safe and profitable employment in financing American foreign trade.

Brushes in Tire Making and Rubber Manufacture

RUBBER manufacturing includes many operations in which the use of brushes, both ordinary and special, is quite indispensable, as in cleaning, cementing, buffing, polishing and painting, as well as for general purposes.

The illustration shows some typical brushes of different forms and material, each intended for some special use in the rubber factory. Their purposes are briefly as follows:

No. 1. FLOOR SWEEP. China bristle floor brush for sweeping smooth cement or wood floors. Adapted for sweeping whiting from mill-room floors and cleaning up around mills and calenders. It is sometimes used in the compound pan in the operation of mixing on account of its convenience for reaching under the mill rolls by reason of its long handle.

No. 2. BRISTLE MILL DUSTER AND BENCH BRUSH. This is commonly used by the rubber mixer for gathering compound ingredients that fall in the pan during mixing, and at the calender when a rubber surface is to be dusted with flour, starch, etc. It is convenient for brushing out mold cavities and removing mold trim and other scrap from work benches in the press room and other departments.

NOS. 3 AND 4. NAPHTHA AND ACID-CURE BRUSHES. These are round and flat tools with bristles set in vulcanized rubber to keep them from coming out when used in naphtha. They are adapted for spreading rubber cement and applying chloride of sulphur in the acid cure of inner tubes.

NOS. 5, 6 AND 7. FINE WIRE HAND SCRATCH BRUSHES. These are used for cleaning soapstone and sulphur incrustations from molds, cores, tube or hose poles. When made of stout flat wire this style of brush is useful for cleaning pole stains from inner tubes. If the work is done with brush and rubber wet, the inner tube may be cleaned without injury by scratching.

No. 8. CURE-ROOM BROOM. A detachable-head broom of specially-dressed bass fiber, for sweeping wet floors.

NOS. 9, 10 AND 11. FOWER WIRE WHEELS. These wheels are made in any diameter and any width of face desired. Wire of various gages and temper is used, according to the work for which the brushes are intended. They are used in power-cleaning tire molds, cores and tube poles, also for buffing cured beads, carcasses and tread bands of pneumatic tires. They are generally used in all tire-repair work, roughing inner tubes for splicing, and cleaning steel bands for receiving the hard rubber base of solid tires.

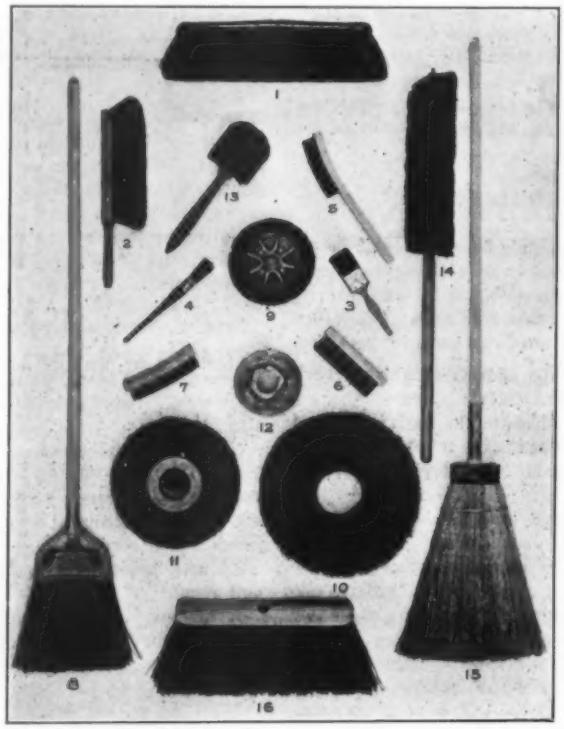
No. 12. WHEEL HUB. A type of hub for securing power brushes to the spindle.

No. 13. BRISTLE BRUSH OF SWAB FORM. The shape of this brush makes it convenient for cleaning hollow spaces such as the inside of tire cases, tire and bead molds, and for applying liquid dressing for whitening the inside of tire casings.

No. 14. BALLOON BRUSH for cleaning dust from balloon and glove forms.

No. 15. WAREHOUSE BROOM made of mixed corn and Japanese fiber for general sweeping where upright brooms are used.

No. 16. PUSH BROOM for heavy sweeping around yards and shipping platforms.



The Osborn Manufacturing Co.

TYPICAL BRUSHES USED IN THE RUBBER INDUSTRY

STANDARDIZATION OF BRAKE-LININGS

The Journal of the Society of Automotive Engineers in a recent issue, makes the following statements: "The lack of definite information and uniform practice with regard to the testing and operation of brake-linings clearly indicates that the establishment of standard tests which can be followed by manufacturers and users and form the basis for purchase specifications will be an important accomplishment in this branch of the industry. Such standards when carefully planned and executed should make possible greater uniformity of materials and establish a better understanding of the essentials involved."

With similar purposes in view the Bureau of Standards, after a joint meeting of the Truck Division of the Standards Committee and the Truck Committee of the National Automobile Chamber of Commerce, held April 21, 1919, agreed to conduct certain tests for the determination of brake-lining specifications and coefficients of friction. The work was to proceed under the general supervision of a subdivision of the Truck Division in cooperation with the Bureau of Standards and the Motor Transport Corps, the latter body to furnish also the necessary apparatus.

Two years later it was found advisable to add representatives of four brake-lining manufacturers, who should construct testing equipment similar to that installed by the Bureau of Standards, and conduct an independent series of tests.

At a conference called at the Bureau of Standards on May 17 of the present year, and when practically all of the brake-lining manufacturers of the country were represented, many problems were discussed, while data of much importance appeared to have been obtained. It was felt, however, that still further tests would be necessary, and more investigations should be made before a final decision could be reached. The comparative information gained by the methods mentioned will undoubtedly prove of much value to the industry.

"ACIDOTEX," A NEW COAGULANT RESEMBLING "COAGULATEX," is prepared and sold in Penang. Its analysis, as reported by *Le Caoutchouc et la Gutta Percha*, is as follows:

Density at 85°	1.445
Sulphuric acid	59.3%
Hydrochloric acid	4.2%
Mineral residue	8.4%

The latter item is equivalent to 122 grams per liter.

News of the American Rubber Industry

NEW INCORPORATIONS

AT-YOUR-SERVICE TIRE CO., February 21 (Kentucky), $75,000. A. L. Smith; A. E. Lang; B. B. Mahan; S. M. Don; C. M. Cummins—all of Louisville, Kentucky. Principal office, Louisville, Kentucky. To deal in automobile tires, tubes and accessories.

Broderick-Lally Tire & Rubber Co. of New York, July 5 (New York), $50,000. T. A. Broderick; M. J. Lally, both of 201 West 38th street; T. L. Hurley, 42 East 11th street—both in New York City. To manufacture tires.

Bronx Solid Tire Co., Inc., July 16 (New York), $15,000. L. A. Allers; L. Biel, both of 27 Cedar street; J. V. Kilroe, 230 West 116th street—both in New York City. To deal in tires.

Clark Rubber Syndicate, Inc., June 29 (New York), $50,000. I. D. Allen, 150 North Union street; F. P. Dunham, 5 Chapin street; S. A. Millington, 57 Huntington Park—all of Rochester, New York. Principal office, Rochester, New York. To manufacture tires and re-treads.

Consumers Tire & Rubber Co., The, June 24 (Delaware), $500,000. M. M. Lucey; V. P. Lacey; L. S. Dorsey—all of Wilmington, Delaware. Delaware agent, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To deal in tires, tubes, etc.

Crosby & Collins Pharmacy, Inc., June 23 (Massachusetts), $30,000. M. F. Ford, 20 Williams avenue, Hyde Park; T. J. G. Armstrong, 37 Fartridge avenue, Somerville; G. M. Faulkner, 1870 Commenwealth avenue, Brighton—all in Massachusetts. Principle office, Boston, Massachusetts. To manufacture and deal in drugs and druggists' sundries.

Duplex Tire & Rubber Co., May 19 (Missouri), $1,000,000. R. W. Crissey, president; C. A. Carlton, secretary and factory manager; R. Coonts, treasurer; L. A. Tooker, vice-president. Principal office, 322 Frisco Building, Joplin, Missouri. To manufacture rubber goods.

Edgar Storms Corp., April 25 (New York), $100,000. J. F. Forrester; L. Dertz, both of 95 Madison avenue; E. Storms, 10 Central Fark West—both in New York City. To manufacture tires, etc.

Enterprise Tire & Supply Co., Inc., June 23 (New York), $6,000. M. A. Ryan, 16 East 48th street; F. D. Braisted, 149 West 84th street; M. J. Sherlock, 261 West 69th street—all in New York City. To manufacture auto tires.

Essandell Tire Co., June 25 (Massachusetts), $250,000. F. G. Saylor, corner Sea & Bayview avenue; W. MacLean, 30 Chestnut street, both of Quincy; G. A. Lufkin, 173 Shirley avenue, Revere—both in Massachusetts. Principal office, Boston, Massachusetts. To deal in all kinds of rubber goods.

Fresno Tire & Rubber Co., February 28 (Nevada), $2,000,000. D. B. Eastman, president, Elks Club, Fresno; C. A. Bunnell, secretary and treasurer, 21 South Morengo avenue, Pasadena—both in California. Principal office, Reno, Nevada. To deal in rubber tires.

Hartford Auto Products, Inc., May 24 (New Jersey), $50,000. L. G. Chandler, president; G. W. Burbery, treasurer, both of 332 Broad street; H. Isherwood, secretary, 738 Broad street—both in Newark, New Jersey. Principal office, Room 906, 738 Broad street, Newark, New Jersey. Agent in charge, H. Isherwood. To distribute automobile supplies and accessories of every kind.

Hurley Tire Co., The, July 6 (Massachusetts), $15,000. D. J. Hurley, 27 Asticou Road; M. G. Downey, 430 Centre street, both of Jamaica Plain; A. Perreault, 352 Washington street, Dorchester; E. Ehler, 189 West Newton street, Boston—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in tires, tubes, etc.

J. F. & S. M. Tire Corporation, The July 1 (Washington), $300,000. J. F. Mora, president, Pittsburg, Calif.; J. F. Stranahan, vice-president; N. Cancvara, secretary; G. Todaro, treasurer. Principal office, Seattle, Washington. To manufacture tires.

Lawrence Tire Service Co., Inc., July 19 (New York), $10,000. S. and B. Zerman, both of Far Rockaway; J. Zerman, Long Island—both in New York. To deal in automobile tires, etc.

Louis Rubber Co., May 18 (Ohio), $5,000. L. M. Latta; W. J. Bennett—both of Akron, Ohio. Principal office, Akron, Ohio. To manufacture rubber articles.

Marathon Rubber Products Co., April 9 (Wisconsin), $300,000. F. H. Schneider, H. E. Damon, J. H. Elliott, R. E. Cjartier, all of Wausau; J. H. Hieb, Merrill—both in Wisconsin. Principal office, Wausau, Wisconsin. To deal in rubber, etc.

Miller-Steiner Rubber Co., June 9 (New Jersey), $100,000. J. M. Miller, president; G. W. Page, treasurer; J. D. Steiner, vice-president and secretary. Principal office, 678 North Olden avenue, Trenton, New Jersey. To manufacture mechanical rubber goods.

National Consolidated Rubber Co., June 24 (Delaware), $750,000. J. M. and J. A. Frere, M. A. Alexander—all of Wilmington, Delaware. Delaware agent, American Guaranty & Trust Co., 206 West 9th street, Wilmington, Delaware.

Non-Breakable Button Corporation, April 14 (Wisconsin), $100,000. S. F. Dietrich, president, 541 Plankinton avenue, Cudahy; C. W. Moebius, vice-president, 530 Linnwood avenue, Milwaukee—both in Wisconsin; L. Ehlert, secretary; W. Pfleger, treasurer. Principal office, 200-210 Pleasant street, Milwaukee, Wisconsin. To manufacture a non-breakable button from high-grade rubber and other ingredients.

Robinson Anti-Splash Tire Co., The, June 28 (Massachusetts), $200,000. C. A. Robinson, 3960 Washington street, Roslindale; J. P. Sylvia, Jr., 1460 Blue Hill avenue, Boston; J. A. Coveney, 103 Walnut avenue, Roxbury—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture Robinson anti-splash tire.

Sales Corporation of America, June 13 (Delaware), $12,000. Delaware Agent, Colonial Charter Co., Wilmington, Delaware. To manufacture rubber articles.

Self-Sealing Auto Tube Co., The, June 11 (Delaware), $850,000. H. C. Adam, H. A. Sperry, M. A. Behrend. To manufacture inner tubes and other rubber products.

Sinar Rim Corp., June 24 (Delaware), $500,000. F. R. Hansell; J. V. Pimm, both of Philadelphia, Pennsylvania; E. M. MacFarland, Camden, New Jersey. Delaware Agent, Corporation Guarantee & Trust Co., 927 Market street, Wilmington, Delaware. To manufacture patented automobile rims.

Solimine Rubber Heel Co., Inc., June 27 (New York), $50,000. C. and A. A. Pellegrino, both of 509 Dean street; C. Solimine, 539 Bergen street—both in Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture rubber heels.

Standard Rubber Cement Co., May 4 (Massachusetts), $10,000. M. S. Azulay, president; E. M. Azulay, treasurer and clerk—both of Stoughton, Massachusetts; J. C. Eccles, Trenton, New Jersey. Principal office, Stoughton, Massachusetts. Factory, Canton, Massachusetts. To buy, sell, manufacture and deal in rubber, rubber cement, etc.

Taylor, L. R., Co., May 16 (New York), $25,000. L. and H. Taylor, H. H. Pickering—all of Freeport, Long Island, New York. To manufacture compressors and ankle reducers.

Tire Jobbers, Inc., The, July 16 (New York), $2,500. E. B. Jensen, 270½ Alexander street; E. B. McGinley, 564 North Goodman street; W. B. Slattery, 266 Garson avenue—all of Rochester, New York. Principal office, Rochester, New York. To deal in tires, etc.

Virginia Sales & Advertising Corporation, The, July 19 (New York), $10,000. C. P. Joslyn; W. Silliman, E. Hayden—all of Buffalo, New York. Principal office, Buffalo, New York. To deal in tires.

West Coast Rubber Corporation, Inc., April 7 (California), $2,000,000. C. L. Williamson, F. C. Jordan, W. F. Petersen, W. W. Felt, Jr., R. Sanford, J. W. MacClatchie. Principal office, 33 Dolores street, San Francisco, California. To manufacture "Bonner" inner tubes.

FINANCIAL NOTES

The board of directors of the United States Rubber Co., at their meeting, July 7, declared the usual 2 per cent quarterly dividend on the preferred stock, but deferred action on the common stock dividend. The sales for the first six months of the year have been satisfactory under the business conditions that have prevailed. The directors have made a careful review of the situation for the balance of the year, and the outlook is encouraging, especially as to tire and footwear sales. While the financial position of the company is strong, the directors deem it conservative to defer action on the common stock dividend for the present.

The directors of The B. F. Goodrich Co. have declared the regular quarterly dividend of 1¾ per cent on the preferred stock, payable October 1 on stock of record September 21, 1921. Sales for the first four months were unsatisfactory but since May 1 there has been a substantial increase and the liquidation of the inventory has been sufficient to reduce bank loans since the first of the year from $29,000,000 to $14,900,000. If present conditions continue, the company will be able to pay off practically all bank indebtedness by the end of the year.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has passed the quarterly dividend of 1¾ per cent on its first preferred stock, due on August 1.

Current earnings of the Lee Rubber & Tire Corporation, Conshohocken, Pennsylvania, are running well ahead of the dividend requirements. Sales for the first three months of the year show a decrease compared with the corresponding period of last year, but since April 1 there has been a marked improvement, making necessary day and night operations, and production is now running at record figures. The present schedule calls for 2,000 tires a day, which is the largest in the history of the company and the demand is greater than the production. The company is free of all incumbrances and the total bank debt is only $500,000. There is cash on deposit in excess of this amount.

The Federal Rubber Co., Cudahy, Wisconsin, has passed the quarterly dividend of 1¾ per cent due on the preferred stock at this time.

NEW YORK STOCK EXCHANGE QUOTATIONS

JULY 25, 1921

	High	Low	Last
Ajax Rubber Co., Inc.	24¾	23	24
Fisk Rubber Co., The	13⅜	12½	13¼
B. F. Goodrich Co., The	33⅛	32	32¼
Kelly-Springfield Tire Co	43¼	39¾	43¼
Kelly-Springfield Tire Co., 8% pfd	77½	77¼	77¼
Keystone T. & R. Co., Inc., The	13⅞	12½	13⅞
Lee R. & T. Corporation	29	28	29
United States Rubber Co	55⅛	53	54¼
United States Rubber Co., 1st pfd	95¼	95	95¼

AKRON RUBBER STOCK QUOTATIONS

The following are closing quotations of July 19, supplied by The App-Hillman Co., Second National Building, Akron, Ohio:

	Bid	Asked
American R. & T. Co., com	30	40
Amazon Rubber Co., The	..	15
Firestone T. & R. Co., com	58	60
Firestone T. & R. Co., 6% pfd	80	87
Firestone T. & R. Co., 7% pfd	64	70
General T. & R. Co., The, com	..	200
General T. & R. Co., The, 7% pfd	70	80
Goodrich, B. F., Co., The, com	30¼	31
Goodrich, B. F., Co., The, pfd	65	70
Goodrich, B. F., The, pfd	65	70
Goodrich, B. F., Co., The, 5-yr. 7% notes	89	90
Goodyear T. & R. Co., The, com	10¼	11¼
Goodyear T. & R. Co., The, 7% pfd	25	25¼
India T. & R. Co., com	..	70
India T. & R. Co., 7% pfd	60	70
Mason T. & R. Co., The, com	9¼	11
Mason T. & R. Co., The 7% pfd	47	50
Marathon T. & R. Co., com	2½	3½
Miller Rubber Co., The, com	50	55
Miller Rubber Co., The, 8% pfd	60	67
Mohawk Rubber Co., The	..	80
Phoenix Rubber Co., com	..	15
Phoenix Rubber Co., pfd	..	80
Portage Rubber Co., The, com	3	6
Portage Rubber Co., The, 7% pfd	5	10
Republic Rubber Corporation, com	⅛	½
Republic Rubber Corporation, 7% pfd	7	9
Republic Rubber Corporation, 8% pfd	2	4
Rubber Products Co., The	..	50
Standard Tire Co., com	..	80
Standard Tire Co., pfd	..	80
Star Rubber Co., com	..	90
Star Rubber Co., 8% pfd	..	100
Swinehart T. & R. Co., com	..	40
Swinehart T. & R. Co., 7% pfd	..	70

DIVIDENDS DECLARED

Company	Stock	Rate		Payable	Stock of Record
Aetna Rubber Co	Pfd.	1¾%	q.	July 1	June 25
Canadian General Electric Co., Limited	Com.	20%	stk.	Aug. 1	July 15
Corn Products Refining Co	Com.	1%	q.	July 25	July 5
Corn Products Refining Co	Com.	½%	ex.	July 25	July 5
Corn Products Refining Co	Pfd.	1¾%	q.	July 15	July 5
Driver-Harris Co	Pfd.	1¾%	q.	July 1	June 21
Firestone Tire & Rubber Co	6% Pfd.	1½%	q.	July 15	July 1
General Tire & Rubber Co	Pfd.	1¾%	q.	July 1	June 20
B. F. Goodrich Co., The	Pfd.	1¾%	q.	Oct. 1	Sept. 21
Grace, W. R., & Co	Com.	4%	s.a.	Aug. 1	July 28
Hodgman Rubber Co	Pfd.	2%	q.	Aug. 1	July 15
Hood Rubber Co	Pfd.	1¾%	q.	Aug. 1	July 20
Kelly-Springfield Tire Co	Com.	3%	stk.	Aug. 15	Aug. 1
Kelly-Springfield Tire Co	8% Pfd.	2%	q.	Aug. 15	Aug. 1
Mason Tire & Rubber Co., The	Pfd.	1¾%	q.	Aug. 20	June 30
New Jersey Zinc Co	Com.	2%	q.	Aug. 10	July 30
Philadelphia Insulated Wire Co	Com.	$2.00	s.a.	Aug. 5	July 30
United States Rubber Co	1st Pfd.	2%	q.	July 30	July 15

EASTERN AND SOUTHERN NOTES

By Our Regular Correspondent

THE New York Rubber Co., 84 Reade street, New York, N. Y., with factories at Beacon, New York, has appointed the following officers: John Acken, president; Henry F. Hering, vice-president and general manager; Milton Loeb, treasurer, and Walter E. Falmer, secretary.

The Ajax Rubber Co., Inc., New York, N. Y., has appointed F. M. Hoblitt general sales manager, succeeding F. E. Dayton, who resigned to become an associated broker with the real estate firm of Cross & Brown Co., and will specialize in the leasing of the new building of The Fisk Rubber Co. at 57th street between Broadway and Eighth avenue.

President Harding accepted the invitation of Harvey S. Firestone to join a camping party which was held last month in the Cumberland mountains. Thomas A. Edison and Henry Ford were present. The three last-mentioned men, with the late John Burroughs, the famous naturalist, held similar excursions annually.

W. G. Loney has been appointed Buffalo sales agent of the Gutta Percha & Rubber Manufacturing Co., whose main offices are at 126-128 Duane street, New York, N. Y. Mr. Loney succeeds C. P. Joslyn, who recently retired from the managership of the Buffalo office.

In a recent issue of *Greater New York*, a weekly bulletin issued by The Merchants' Association of New York, the following item was noted in the list of names of those lately added to the membership of the Association's committee on industrial relations: "C. S. Ching, United States Rubber Co., has been appointed supervisor of industrial relations."

The Beacon Tire Co., Inc., Beacon, New York, is adding about 10,000 square feet of floor space to its factory, to be used for tire building and vulcanizing. It is expected that this addition will be completed by September 1 and will bring the factory capacity up to about 800 cord tires daily.

The Pines Rubber Co., Brooklyn, New York, incorporated December 16, 1914, with a capital of $75,000, to manufacture rubberized fabrics, has increased its capital to $200,000. Actively interested in the company as its incorporators were the following: Joseph Pines, No. 260 Ocean Parkway; David Pines, No. 828 Eastern Parkway; and Morris Pines, 1524 St. Mark's avenue —all in Brooklyn, New York.

Ernest F. Kling has been appointed factory manager of the Batavia Rubber Co., Batavia, N. Y. Mr. Kling was formerly chief analytical chemist with Morgan & Wright, Detroit, Michigan, and assistant factory manager of a branch factory of the Fiat Automobile Works, having been overseas from 1915 to 1919. Early in 1920 he became connected with the Batavia Rubber Co., first in the capacity of chemist, later being placed in charge of construction and compounds.

The Goodyear Cotton Mills, Inc., Goodyear, Connecticut, resumed operations July 5, on a one-shift basis. The present production is approximately 40,000 pounds weekly, while 175 people are employed. Last year the output was 160,000 pounds weekly on a three-shift basis. The company expects production to remain on the present basis for the remainder of the year.

PENNSYLVANIA NOTES

The East End Tire Co., Inc., incorporated in Pennsylvania four years ago, is capitalized at $45,700. Its only office is at 5901 Penn avenue, Pittsburgh, Pennsylvania, and its present officers are: F. W. Fischlein, president; W. E. Ireland, vice-president; H. C. Grubbs, secretary and treasurer; and M. A. Hillard, assistant treasurer.

The McCreary Tire & Rubber Co., Indiana, Pennsylvania, has appointed Homer C. Steffen sales manager. The company manufactures McCreary tires and tubes.

J. H. McGachan, formerly with The Portage Rubber Co., Barberton, Ohio, and later chief chemist of the Mason Tire & Rubber Co., Kent, Ohio, is now a member of the organization of the Rex-Hide Rubber Manufacturing Co., East Brady, Pennsylvania. Mr. McGachan has had a wide experience along tire-manufacturing lines.

The Southern Carbon Co., Williamsport, Pennsylvania, incorporated under the laws of Delaware February 5, 1917, with a capital of $1,000,000 fully paid in, is a subsidiary of the Columbian Carbon Co., of the same city. The company was organized to produce natural gas and manufacture gas carbon black and gasoline. The officers are: G. L. Bubb, president; F. F. Curtze, vice-president; N. B. Bubb, treasurer; and R. L. Carr, secretary.

SOUTHERN NOTES

The Eastern Rubber Products Co., 361 North Calvert street, Baltimore, Maryland, was incorporated under the laws of that state on November 26, 1920, to purchase and deal in all forms of rubber. The capital stock consisted of 800 shares of preferred stock, par value $50; 600 shares common, without par value. The company is now planning to install rubber-working machinery in its new plant. Charles B. Kegarice is secretary and treasurer and the other incorporators included Charles M. Wyatt and Charles F. Black, both of Baltimore.

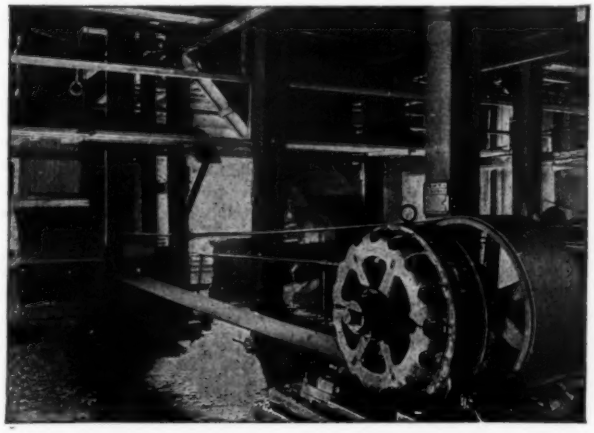
The Diamond Holfast Rubber Co., Atlanta, Georgia, has elected the following officers: H. I. Diamond, president and treasurer; Herman Ditt, secretary; H. I. Diamond, Herman Ditt, Gadsden E. Russell, George W. White, S. B. Turman, C. A. Tappan and W. W. Griffin, directors. The company has recently purchased a new factory site of 11 acres on which to build a

modern fireproof concrete building, having outgrown its present factory which is operating day and night. One of the new specialties of this company is "2-Plex" combination electrical tape which replaces the rubber tape and friction tape generally used for insulation.

"TEST SPECIAL" RUBBER BELTING

A remarkable example of the durability of rubber belting is being furnished at the plant of the Champion Fibre Co., Canton, North Carolina.

The belt in question is one which has traveled most of the time through 24 hours a day, at the speed of 6,273 feet per minute. It has been in use for six years, and is still running.



A DEMONSTRATION OF RUBBER BELT EFFICIENCY

The installation was made by The New York Belting & Packing Co., 91-93 Chambers street, New York, N. Y. The claims of this company regarding the great strength and endurance of its "Test Special" rubber belting would seem, in this instance, to be fully substantiated.

THE RUBBER TRADE IN NEW JERSEY

By Our Regular Correspondent

THE tire situation in Trenton is holding its own at the present time and the plants are busy. One manufacturer said: "This is the time of the year when there is a large demand for tires. But the volume of business is not as great as it should be." Another rubber manufacturer said he did not believe the industry would show any great strides before fall. "The fact that the rubber mills are not as busy as they should be was proof that the demand for tires would not increase any this summer."

The Globe Rubber Tire Manufacturing Co. still has a night force at work and expects to continue the double shift all summer. An official of the Empire Tire & Rubber Corporation said that his plant was fairly busy and that he expected to see the tire business improve shortly. The mechanical end of the business, he declared, was much brighter. The Bergougnan Rubber Co. is running 75 per cent of capacity. The Zee Zee Rubber Co. reports business good. The Ajax Rubber Co. reports that the outlook for the concern is very bright and that there has been much improvement of late.

The scrap rubber business is not very encouraging. The Nearpara Rubber Co. is running full time, but the business is not very good. Prices of scrap rubber are at the lowest levels and there is no telling when they will advance.

Tire prices continue to be very low and in some instances tires are selling at less than pre-war figures. It is said that the average mileage of high-class tires has increased, in some instances, 100 per cent.

TRENTON NOTES

Affiliation is announced between the Thermoid Rubber Co. and the Detroit Pressed Steel Co., in the manufacture of the Thermoid universal joint. The consolidation of these two well-known companies in this particular line of manufacture is a significant event in the automotive industry.

The Acme Rubber Manufacturing Co. and the Essex Rubber Co., Trenton, will display their goods at the trade exposition to be held in Caracas, Venezuela, this fall.

The Grizzly Rubber Co., Trenton, has been appointed the Trenton representative of The Mason Tire & Rubber Co., Akron, Ohio, and will handle Mason tires in the surrounding territory. Richard R. Rogers, head of the Grizzly Rubber Co. for a number of years, was identified with the Empire Rubber & Tire Corporation, both in manufacturing and selling.

Edward T. Comly, secretary of the Acme Rubber Manufacturing Co., Trenton, recently gave a talk before the Rotary Club on the making of garden and other hose.

The plant of the Trent Rubber Co. was sold at public sale on June 22 for $100,000 to Edgar W. Hunt, representing some of the creditors. In August the plant will be turned over to the purchasers, while in the meantime operations are being continued under the managership of J. O. Bigelow, the receiver. The company was incorporated more than two years ago under the name of the Atlas Tire & Rubber Co. and later the name was changed to the Trent Rubber Co. The plant was erected at a cost of more than $300,000.

The automobile service station of Charles H. West was destroyed by fire on June 23, causing a loss of about $15,000. More than 400 Bergougnan tires and tubes were burned, together with two automobiles. The loss is covered by insurance.

THE STOKES ASBESTOS CO.

The new plant of the Stokes Asbestos Co., Trenton, New Jersey, is now operating at about one-third capacity, but will be at maximum capacity as soon as additional machines, already installed, have been adjusted and put into service. This plant is an adjunct of the Thermoid Rubber Co., which uses asbestos metallic cloth in the manufacture of brake lining.

PLANT OF THE STOKES ASBESTOS CO., TRENTON, N. J.

The principal raw material used in the preparation of this product is crude asbestos, which is mined in Canada. The process includes spinning this material into yarn around small strands of brass wire. This metallic yarn is then woven into an asbestos metallic cloth, which finally appears in rolls approximately 100 yards long. The finished cloth, then delivered to the Thermoid Rubber Co., undergoes several processes, the last of these being vulcanizing. This final treatment gives the product a uniform density throughout, and does not destroy its fabric nature.

The machinery in the new buildings is of the newest design,

and has many interesting features, including a complete dust-exhausting and collecting system, connected with each machine and planned to safeguard the health of the employes.

The officers of the Stokes Asbestos Co. are: J. Oliver Stokes, president; William J. B. Stokes, treasurer; Robert J. Stokes, secretary and assistant treasurer. William C. Aichele is superintendent and Edmund W. Craft is the purchasing agent.

MISCELLANEOUS NEW JERSEY NOTES

Counsel for Elgin G. McBurney, receiver for the Indian Tire & Rubber Co., New Brunswick, has filed a report showing total receipts of $48,037.92 and disbursements aggregating $23,376.14, leaving a balance of $24,661.78 available for the payment of allowances, costs, etc., and claims aggregating $129,083.10.

The Smith Rubber & Tire Co., Inc., Garfield, New Jersey, plans to put a night shift at work to meet the increasing demand for tires. At a special meeting, July 8, the concern was placed on a monthly dividend-paying basis: the first dividend of one per cent being payable August 1. Winfield Clearwater is president of the company.

A statement which appeared in our last issue is herewith corrected. The New Jersey Rubber Co., Lambertville, is not owned by the E. H. Clapp Rubber Co., of Boston, the latter having no interest in the former company.

The Eckrode Rubber Co., Viehmann Building, New Brunswick, will conduct selling operations for the Eckrode Rubber Co., Inc., Newark. E. A. Sattler, recently elected vice-president of the corporation, will have charge of sales, assisted by Theodore Weigele. Both men were formerly with the Howe Rubber Corporation, New Brunswick, New Jersey, as director of sales and assistant sales manager, respectively. The Eckrode products at the present time include red inner tubes and repair accessories, and national distribution is planned before the end of the year. Sales have previously been confined largely to the Eastern States.

NEWARK FACTORY OF L. E. WATERMAN CO.

The L. E. Waterman Co., New York, N. Y., fountain pen manufacturer, late in the winter purchased the factory of the General Phonograph Co., 140 to 150 Thomas street, Newark, New Jersey, and took possession in the spring. It also took title to a large area of land surrounding the factory, on which to lay out a baseball park, tennis courts, playgrounds, and other equipment for outdoor recreation and pleasure to benefit employes.

The new building, of concrete and steel, contains 250,000 square feet of floor space and is the largest of the company's five plants

LARGEST FACTORY WHERE WATERMAN PENS ARE MADE

in this country and Canada. It is equipped with the most up-to-date machinery and will produce approximately 10,000,000 fountain pens yearly. A private siding gives direct connection with the Pennsylvania railroad. There is a separate power plant, of 600 h.p., and a 100,000-gallon water reservoir.

The factory proper provides space and facilities for the manufacture of the company's pens and ink; for the ornamentation of the metal work; for packing, casing and shipping; for an emergency printing plant; for making, combining, and shipping dealer and window display material; an employes' locker room, and a completely equipped clinic in charge of a nurse. Other special features for the benefit of employes include a cafeteria, rest rooms, and an auditorium for meetings and entertainments.

THE RUBBER TRADE IN RHODE ISLAND

By Our Regular Correspondent

THE manufacturing rubber industry in Rhode Island during the past month has been in a somewhat chaotic condition, in fact so much so that any statement as to a general situation is difficult and unsatisfactory. The safest, most consistent statement in this connection is that business is unsettled and the future uncertain.

At the same time the numerous textile factories throughout Rhode Island that produce textile fabrics for tire purposes and that have been idle for a considerable period, are showing evidences of awakening. The resumption, however, is on a restricted schedule.

The Millville plant, a footwear division of the United States Rubber Co.'s system, was closed December 10, 1920, and has remained so ever since. The calender department started operations on the morning of July 11 and the employes of the cutting room came in the following day. The first day's making, however, was not until July 14, when the bootmakers returned, the resumption thus taking place in one department after another as usual, the packers being the last to strike in on July 15. About 50 per cent of the employes, numbering approximately 4,000, have been called in.

The "Keds" division of the National India Rubber Co. closed July 15 for an indefinite period. Three days later, on July 18, the wire division of the plant resumed operations after having been closed for a number of weeks. New orders for tennis goods have been rather scarce so far this year and until a more promising outlook for the sale of these products presents itself, the length of the present shut-down can not be determined.

In order that the employes at the National factory may seek employment in other localities, during the present slack period, and still remain in a position to return to work for the company, if they so desire, the announcement was made previous to the shut-down as follows: "Leave of absence for a definite period of any length up to one year, will be granted to anyone at present in the employ of the company. Reemployment is guaranteed provided the person on leave returns at the time which he has specified. In most cases he or she will be returned to the same type of work as that upon which they were working at the time the leave was granted. When that is impossible, employment will be given at some other job with an equal class wage."

The American Wringer Co.'s plant at Social street, Woonsocket, Rhode Island, which some months ago was put in the hands of the Industrial Trust Co. of this city, as receivers, closed down July 15 for a two weeks' vacation. This shut-down affected the entire plant, with the exception of the mechanical roll department, employing about 60 hands. The factory in normal times employs about 800 hands, but only about 350 have been at work recently. Since the company went into the hands of the receivers there has been a general curtailment of operating expenses through consolidation of official duties and concentration of efforts.

Arthur Campbell resigned as assistant superintendent, after being with the American Wringer Co. for ten years, first as head of the stock department, later as production manager, and for the last two years as assistant superintendent. William J. Meakin, for

forty years an employe of the company, and for 25 years foreman of the tool room, in charge of the erection of the large mangles and the large tobacco wringers, has resigned his position. Percy A. Greenwood, foreman of the finishing department, has also resigned. He has been with the company for the past fifteen years.

Members of the Davol Rubber Company Mutual Benefit Association recently gave a minstrel show to mark the opening of the new recreation rooms provided by the company. No admission was charged, but the attendance was limited to members of the Association. The circle was made up entirely of young women, the "end men" and chorus numbering nearly forty of the women employes. Next winter it is intended to hold a series of socials, entertainments, dances and other social features.

Harold De Blois Rice, who for the past two years has been chief chemist of the National India Rubber Co. at Bristol, Rhode Island, and Miss Madeline Ives Goddard were married July 7. After a wedding trip to New York and Maine they will live in Bristol.

The Providence Rubber Co., Providence, has reduced its capital stock from $500,000 to $100,000, according to the filing of an amendment to its charter at the office of Secretary of State Parker under the laws of Rhode Island, the papers being signed by Samuel P. Colt as president and Clarence H. Guild as secretary. The original charter was granted by the General Assembly of Rhode Island at the May session, 1892, and a few years later was changed to the Marine Rubber Co. which at the January session, 1921, was changed to the Providence Rubber Co., and the capital stock increased to $500,000.

The fourth annual outing of the Tubular Woven Fabric Co., Pawtucket, Rhode Island, took place July 16, at the Warwick Club on the west shore of Narragansett Bay, where the employes were conveyed by special electric cars. After luncheon a long list of sports and field games afforded amusement for both participants and onlookers. The first event was the baseball game between the Weavers and Duras, in which the former, having the most runs to their credit, were awarded the prize. Next in order on the program was the clambake, which was served at 3.30 o'clock. Paper hats and toy balloons were distributed among the diners and throughout the dinner merriment and good cheer were not lacking. Music was furnished by the orchestra during the dinner hour, as well as for dancing. Late in the evening the return journey was made.

The Ellingwood Tire Co., 112 Fountain street, Providence, has been succeeded by the Schieber Rubber Co.

The Narragansett Vulcanizing Works, 271 Richmond street, Providence, is owned and conducted by Charles S. McCullum and Harry A. Davis, according to their statements filed at the city clerk's office.

The Kelly-Springfield Tire Co. has given up its Providence branch at 143 Broad street, and the Belcher & Loomis Hardware Co., 83 Weybosset street, has taken over the local agency.

PROVIDENCE RUBBER CO. TO MAKE U. S. TIRES

J. N. Gunn, vice-president of the United States Rubber Co. and president of the United States Tire Co., announces that the Providence Rubber Co. has been organized to take over tire manufacturing operations at Providence heretofore conducted under the name of the Revere Rubber Co., Colt Plant, Providence, Rhode Island. The local officers of the company are John J. Shea, vice-president and factory manager, A. P. Delahunt, assistant secretary and assistant treasurer. This plant will continue to be known as the Colt plant. The Revere Rubber Co. will continue to operate its large mechanical plant, located near the Colt plant, as heretofore.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients," also "Rubber Machinery."

THE RUBBER TRADE IN MASSACHUSETTS

By Our Regular Correspondent

TIRE demand and consequent production continue to improve, with most plants operating at 75 per cent capacity or better. Increasing general business, the vacation season and the influence of lower tire and gasoline prices on those who motor chiefly for pleasure have helped to stimulate tire buying. The mechanical rubber goods situation remains unchanged and waits upon increasing industrial activity. Manufacturers of druggists' and stationers' sundries report about 75 per cent of normal business with little prospect of betterment before autumn. A little improvement is being felt in the proofing branch of the trade, increasing automobile sales calling for more top material. Orders for raincoat materials are fairly good and business in rubber heels and soles continues satisfactory. The reclaim market remains featureless with output greatly curtailed, and despite the slightly higher crude rubber prices which have ruled of late, little rubber is being sold; due not solely to lack of demand but partly to the fact that holders of rubber are selling only in case of absolute necessity.

Rubber footwear orders have been but partial and late in arrival, with the result that most manufacturers now have on hand sufficient orders for all they can produce during the remainder of the season, and after their customary summer shut-downs will be operating very near capacity. As the mills have found it expedient to make up rubber footwear on order only, a shortage this coming winter is not improbable.

Many reorders are reported on canvas footwear, for which the demand promises to be good for the remainder of the summer. This year, in deference to the suggestion of retail merchants, the announcement of the new tennis prices will be postponed until after September 1, it having been found that the earlier announcements of the past have interfered with retail business in the middle of the selling season.

BOSTON NOTES

The National Shoe and Leather Exposition and Style Show, held in Mechanics' Building, Boston, from July 12 to 14 inclusive, was pronounced the greatest ever held, and buying was regarded as fair considering existing conditions. Rubber and canvas footwear formed a notable feature of the show. Bathing and outing girls exhibited the many kinds of rubber and fiber soled canvas shoes for sports wear, while men in hunting costume and lumberjacks displayed heavy rubber footwear for hard service. The "Rubber Girl" of the United States Rubber Co., in a rubber bathing costume of brilliant hue, and white bathing shoes, was one of the belles in a galaxy of models. The Hood Rubber Products Co., Inc., was a notable participant in the big street parade on July 12.

Herbert Hoover, Secretary of Commerce, was the guest of honor, and his message, briefly stated, was to the effect that America has already turned the corner in business, but that unless the buying power of many thousands is to remain curtailed, foreign markets must be thrown open to some of our great industries.

Several new types of soles with rubber plugs for golfing were exhibited at the Style Show, the idea being to produce golf shoes which will not cut up the golf course or scratch the club-room floors. For example, a sport shoe with two rubber plugs on the sole and two on the heel, the latter two being reinforced by a crescent set into the leather, has been brought out by the English firm of Church, Northampton. The rubber plugs give a firm tread on the golf grounds or tennis court and eliminate the damaging metal spikes. The plug attachments can be bought separately from the shoe.

Everett Morss, president of the Simplex Wire & Cable Co., Simplex Electric Heating Co., and the Morss & Whyte Co., wire manufacturers, was recently elected president of the Boston Chamber of Commerce. Mr. Morss is chairman of the executive

committee and a member of the corporation of the Massachusetts Institute of Technology, a Fellow of the American Institute of Electrical Engineers, a director of the Boston Belting Co., Chemical Products Co., The First National Bank of Boston, and has numerous other interests. During the war he served the Government in various capacities, notably as New England representative on the Priority Committee of the Council of National Defense, and later as chief of the brass and copper tube section of the War Industries Board. He has always taken an active interest in the Boston Chamber of Commerce, having served as a member of its committee on industrial relations and as chairman of its special committees on Federal trade matters and social insurance, and his election to the presidency at this critical time is regarded as a fortunate choice.

E. D. Winans, district manager in New England for the Ajax Rubber Co., Inc., reports a remarkable response to the first advertised announcement of the new black tread Ajax cord tire and its new features.

The Hazen-Brown Co., manufacturing cements, has removed its offices from the former Beach street address to 727 Atlantic avenue, Boston. This is also the headquarters of the Gleasonite Co., manufacturing heels and soles, of which F. J. Gleason is president; Louis Brown, vice-president; G. F. Kerr, secretary, and Max Brown, treasurer.

George E. Hall, president and general manager of the Boston Woven Hose & Rubber Co., accompanied by his wife and two older daughters, sailed for Europe on the "Aquitania" July 5, where they will visit the company's London office, Paris, the battlefields of France, and other points of interest on the Continent, returning about September 1.

Barney Oldfield, of racing fame and head of the Oldfield Tire Co., Cleveland, Ohio, was a recent visitor in Boston, conferring with R. W. Harris, New England distributer for Oldfield tires, and also renewing old acquaintances.

H. T. West Co., dealing in oils and naval stores, carbon blacks, etc., has removed from 148 State street to 132 Library street, Chelsea 50, Boston, Massachusetts.

MISCELLANEOUS MASSACHUSETTS NOTES

George B. Hendrick, publicity director for The Fisk Rubber Co., Chicopee Falls, Massachusetts, was recently elected president of the Publicity Club of Springfield, in the same state.

The Appleton Rubber Co.'s plant at Franklin, Massachusetts, closed the past month, operations being suspended indefinitely on July 2. This shut-down was due to the present conditions of the insulating business but it is expected that operations will be resumed when conditions become better.

The Converse Rubber Shoe Co., Malden, Massachusetts, closed its plant on July 22 until August 8, for the customary summer vacation shutdown. In the interim necessary repairs will be made and considerable renovating done.

Directors of the Converse Rubber Shoe Co., Malden, Massachusetts, at a recent meeting voted to separate the tire business from the footwear business and organized the Converse Tire Co., a distinct corporation, with a capital of 10,000 shares of preferred stock, with a par value of $100, and 10,000 shares of common, without any par value. The new concern plans to deal directly with the dealer, and will have quick assets of about $1,000,000.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has continued to gain ground since the latter part of May, when a big improvement in business was felt. July production schedules called for an output of 175,000 tires, as compared with about 120,000 for the month of June. On July 20, however, the plant was operating at about 90 per cent capacity, turning out 8,500 casings and 10,000 inner tubes a day, as against 2,500 casings at the low-level of the depression last winter. To conserve cash resources, however, the directors have voted to omit the quarterly dividend of 1¾ per cent on the first preferred stock, usually payable August 1.

The Davidson Rubber Co., manufacturer of druggists' and stationers' sundries, dental gum and hard rubber, Charlestown, Massachusetts, is operating at 75 to 80 per cent capacity and anticipates a continuance of business in about that volume for the near future.

The Mystic Rubber Co., clothing, druggists' sundries and dress shields, West Medford, Massachusetts, reports a great increase in orders during the past month, and officers of the company regard the future with optimism.

The Crompton & Knowles Loom Works, manufacturer of tire fabric looms, Worcester, held closing exercises in its Americanization classes early in July, when ninety-four students, thirty of them forty years of age or over, received certificates. The exercises were held at Knowles Park, a forty-acre tract where employes may enjoy such recreation facilities as a club house, picnic grove, baseball diamond, running track, playground swings and garden plots. Barbecues by groups of employes are held during the summer months, clam bakes and sheep roasts being the feature of such occasions.

RUBBER SECTION OF NATIONAL SAFETY COUNCIL CONVENTION ARRANGES PROGRAM

As a part of the program of the National Safety Council Convention to be held in Boston, September 28-30, a luncheon will be given, on September 28, by the Rubber Section.

Among the speakers at this special session will be the following: H. S. Firestone, of the Firestone Tire & Rubber Co., Dr. Lothar E. Weber, and Frederic C. Hood, president of the Hood Rubber Co. The latter will speak on the subject: "Safety from the Factory Manager's Viewpoint."

F. J. Hoxie, engineer and special inspector of the Associated Factory Mutual Fire Insurance Companies, will give an address on "Fire Hazards and Static Electricity in the Rubber Industry." Mr. Hoxie is recognized as one of the foremost experts on this subject.

AKRON RUBBER INDUSTRY APPROACHING NORMAL CONDITIONS

Special Correspondence

AKRON, the rubber center of the world because more than 65 per cent of the world's tires and 40 per cent of all rubber goods are manufactured there, is emerging from the eight months' universal business depression more rapidly than any other city in the United States. The rubber industry is now within 70 per cent of normal production and practically every resident rubber worker in the city is employed.

Goodyear leads all companies in rapidity of recuperation and is now producing 25,000 tires and 30,000 tubes a day. Firestone is making 23,000, which is close to normal production. Goodrich is now making close to 15,000 tires a day, which is much better than 70 per cent production. Miller is adding men and production is now better than 4,000 tires daily.

While the larger companies have increased production the smaller concerns have advanced with leaps and bounds. The American Tire & Rubber Co. is operating three eight-hour shifts at peak production. The General Tire & Rubber Co. is working one day-shift at 100 per cent normal production. The India Tire & Rubber Co. is doing better than 90 per cent of normal. Swinehart's production is running close to 70 per cent. Kelly-Springfield is a month behind orders. The Rubber Products Co.'s plant is doing better than 80 per cent normal while its tire department is 5 per cent above the remainder of the factory. The Mohawk is operating at above 60 per cent of normal.

Conservative estimates on the part of employment managers indicate that in May, June and July 8,000 men were placed in the factories. Much of the increased production, however, has been the result of longer hours, as well as increased efficiency of the plants as a whole.

Railroads already show the effects of the increased production. Outbound tonnage has increased more than 20 per cent and is close to 70 per cent of last year. The increased business has come from dealers in every part of the United States except the South and automobile manufacturers who have returned to more normal production. Many dealers' and manufacturers' orders have been held up because stocks were exhausted and the tires have had to be built.

It must be borne in mind that while other industries were shut down because of the depression, 9,000,000 automobiles and 1,000,000 trucks continued to wear out tires. This replacement on old cars explains the disappearance of the huge stocks in the warehouses when the depression came. From time to time THE INDIA RUBBER WORLD has stated that the stocks were gradually disappearing but the sales and shipments were made so quietly that when the dealers finally came to actually buy they were confronted with the fact that before the tires could be shipped they had to be manufactured. Since Akron factories are today making tires only for actual orders there is reason to believe that warehouse stocks will be small this summer.

Regarding factory efficiency, the plants have increased per capita production more than 30 per cent. Thousands of so-called non-producers and thousands not actually connected with production have left and the chances are they will not return. Paper work has been decreased 75 per cent; tire building has increased in efficiency; every employe is doing necessary work; departments which do not relate directly to the production, selling and shipping of manufactured goods have been wiped out and only the essential departments remain. This has been the case in practically every factory; other overhead has been similarly decreased; welfare work has been cut to the bone; departments duplicated in factory and general offices have been combined; and every effort is being bent towards the efficient production of manufactured products.

Another factor is that every man in the factory knows his job. This has cut the immense turnover and cost of breaking in new men. Today when a man is hired, the office records tell exactly what he can do by the records of his past performance. Another result of increased efficiency is the decrease in losses due to oversights on the part of workmen. In the old days inspection became lax and seconds were turned out in large numbers. Today when a tire leaves the mold it is a tire in every sense of the word and few are returned for adjustment.

During the worst days Akron rubber men never lost hope and perhaps no city in the United States remained as consistently optimistic. Plans for better housing, better streets, more paved roads and better facilities were never dropped. The men of Akron looked to the future, not blindly, but upon the basis of hard facts. They knew the tire business and what stocks were on hand and how rapidly they were being depleted; knowing that, they could prepare for the better day which was never far distant in their minds. The depression was a bitter pill, perhaps, but it was the only manner in which Akron could be brought back to a safe and normal basis. The inflated structure of the war and post-war period had to be torn down so that rebuilding could be started upon the solid foundation of conservative business methods.

With the entrance into the second half of the year it is believed in banking and business circles that a period of operating profit has been entered. That dividend payments will be resumed in the near future is not looked for because the companies will probably desire to pay off as much indebtedness as possible and build up a surplus before beginning again to disburse profits.

THE RUBBER TRADE IN OHIO

By Our Regular Correspondent

AKRON—FOURTEENTH INDUSTRIAL CITY OF AMERICA

IF it were possible, the rubber industry would have been given additional importance in the commercial world by a report of the Akron Chamber of Commerce in which it is shown that Akron, making 65 per cent of the world's tires and at least 40 per cent of all the rubber goods of the world, is the fourteenth American industrial city, with a total industrial output in 1920 of more than $640,000,000, of which more than three-fourths was of rubber goods.

Philadelphia, for instance, with a population nine times that of Akron, produced only slightly over three times as much as was produced in Akron in 1920. Detroit, with five times the population of Akron, shows an industrial output of only two and one-third times that of Akron.

In Ohio, Akron ranks third in the list, although Chamber of Commerce officials have expressed the opinion that if the Cincinnati figures were accurately available it would be found that Akron outranked it.

The growth of the automotive industry during the past ten years is also apparent in the Akron industrial figures. In 1915, the first year for which figures were available, the total output amounted to $156,000,000, and the pay-roll of the industries amounted to little more than $25,000,000. The output as shown by the table last year was $640,000,000 and the industrial pay-roll amounted to $145,000,000.

These figures include all industries, but during that period the rubber industry has become so predominant that the increase is really indicative of the rubber industry growth. In 1910 a total of 23,000 were employed in the Akron factories.

RUBBER MEN OPPOSE TARIFF

E. G. Wilmer, president of The Goodyear Tire & Rubber Co., sent a telegram to Ohio senators, stating that the prohibitive tariff on foreign merchandise will work a hardship upon American companies who are making strenuous efforts to obtain a foothold in foreign fields. This telegram was the first expression from any of the leaders of the Akron rubber industry against the proposed tariff. Most of the rubber men in Akron, although regarded as Republican in their sentiment, are said to have privately expressed themselves as of the opinion that prohibitive tariffs would react by closing foreign markets to American goods.

The matter of foreign trade has assumed large proportions in Akron during the past year, as is shown by the number of Akron rubber company representatives who have gone abroad and the manner in which meetings regarding foreign trade are attended.

MAKE RECORD IN HEEL PRODUCTION

The production of rubber heels during the past year was the largest in the history of the Akron rubber industry. More than 100,000,000 pairs of heels were produced in Akron during the twelve months. The Miller Rubber Co. led all other companies with production of 40,000,000 pairs. Goodyear came second with 30,000,000 pairs and Goodrich, it is estimated, produced approximately 22,000,000 pairs. The smaller companies made up the remaining 8,000,000 pairs. One pair of heels was produced for every man, woman, and grown child in the United States.

These heels applied at the average Ohio prices cost the American people approximately $60,000,000 during the year, it is estimated. The June heel production at Goodyear was 3,500,000 pairs.

Although definite figures have not been given out, the sole business increased materially during the year. The Goodyear Tire & Rubber Co. alone received early in June one order amounting to 440,000 from a chain store company in the East.

AMERICAN TIRES STIMULATE EUROPEAN MANUFACTURERS

E. M. McIntosh, of The Goodyear Tire & Rubber Co., after a fourteen-month survey of European tire and automotive conditions, states that the American straight-side pneumatic tire is winning favor with the Europeans and that the tire business on the Continent is being revolutionized.

The sale of the American trucks and automobiles taken over with the American army has publicized the American pneumatic tire in Europe and formed the opening wedge in what has heretofore been largely a solid tire field. The Europeans saw the advantage both in comfort and in the preservation of the highways of using the pneumatic tire and rapidly arrangements are being made to change from solids to pneumatics.

European tire manufacturers, like Dunlop, of England, Michelin, of France, and the large German tire factories, including the Continental, are also preparing to enter the pneumatic field as never before, and it is only better selling methods and leadership in the industry which will make it possible for America to obtain a share of the business. Molds are being made for the new European pneumatics and fabric is being purchased in such quantities as the exchange and economic conditions permit, so that large numbers of the pneumatics can be produced.

With the transition from the solid to the pneumatic tire an entirely new field for the sale of repair machinery, service stations, jacks, gages and the other accessories which go with the pneumatic tire business is opened for the American manufacturer. These tools and accessories are not yet available on the Continent and the Europeans are looking to America to furnish these supplies.

Several well-known bus lines, both in London, England, and Paris, France, which heretofore operated on solids are changing to pneumatics.

AKRON NOTES

The American Rubber & Tire Co., Akron, has been successful in its first effort to branch out from the manufacture of tires and tubes by making a bathing shoe of novel design. The first shoe was produced six months ago and from the first it was a success, with the result that orders are coming in rapidly. The management is exceedingly conservative and refuses to advertise, depending entirely upon salesmen and repeat orders from dealers. At present the factory is operating on a normal production basis. The company recently sold $600,000 worth of preferred stock which made other financing unnecessary.

Officials of The Goodyear Tire & Rubber Co., from both the Los Angeles and Canadian factories, conferred with the new management during the second week in July regarding a general speeding up of the branch factories. The economies which have been put into practice in Akron as well as the new efficiency plans were discussed with the out-of-town officials.

C. T. Crudington, a member of the Goodyear News Service, has been transferred to the sales department as a general line salesman. He will work out of Council Bluffs, Iowa. He was formerly editor of *Goodyear Tire News* for Goodyear dealers. Harold King, of the sales force, will edit the *Triangle*, published for Goodyear salesmen.

The recuperation of The Goodyear Tire & Rubber Co. is the result primarily of "hard work," according to L. C. Rockhill, sales manager.

"If our recuperation is exceptional, as is stated in many quarters, it is because every man working for Goodyear felt that only by 'buckling down' and producing the maximum result from every ounce of effort could pull Goodyear through.

"It was necessary to reduce the sales force together with other departments during the last of 1920 and the early part of this year, and those men who remained knew that upon them depended the future of the company. And they have produced nobly."

Formerly it required one man a day to produce one tire. This was the universal production rule, at least in Akron. But today not only has this ratio been lowered at Goodyear but throughout the industry here. Actual figures regarding men employed in the factories cannot be obtained but it is reported that the 25,000 tires a day being made by Goodyear are produced with almost half of that number of men. In 1920 it was well known that the company was producing 31,000 tires a day with approximately the same number of men.

John Henry Vance, power engineer of The B. F. Goodrich Co., has been elected president of the Akron Engineering Society. H. S. Morse, of the employment department, former city service director, was also a candidate for the office.

Among the rubber officials who have returned from extensive trips to European countries are Dr. W. C. Geer of The B. F. Goodrich Co. and V. L. Brogneaux of the foreign department of The Goodyear Tire & Rubber Co. Dr. Geer visited England and France. Mr. Brogneaux, in a statement given out by Goodyear, said that one of the greatest handicaps in Belgium for the sale of tires and automobiles was the lack of gas filling and repair stations, but that indications are that the future will see Belgium develop as a user of automobiles.

The Goodyear Tire & Rubber Co. early in July received an order for 38 kite balloons and three dirigibles from the Government. It will require the better part of a year to complete the order. The interest shown by the new management in aircraft business is taken as an indication that efforts will be made to keep the company in the forefront of the air transportation industry. Goodyear is one of the few companies which can build completely and test on its own property all varieties of lighter than air craft.

C. P. Raney, formerly assistant manager of the Miller Tire Repair School since June, 1919, has accepted a position as Akron branch manager for the Western Rubber Mold Co., Chicago, Illinois, succeeding L. W. Bourland. The Akron office has been removed from 847 South Main street to 15 North Summit street. Mr. Raney has had nine years' experience in the rubber industry, as tube inspector, department foreman and industrial engineer for a large tire company.

C. E. Wagner, export manager for The Miller Rubber Co., Akron, Ohio, recently returned from a trip to Mexico City. He reports that Frank Gamundi, manager of the Miller company's Latin-American division, is calling on the trade in Porto Rico and Cuba.

Burt A. Waltz, for the last two years chief engineer for The Portage Rubber Co., and formerly with the Osborn Engineering Co. and The B. F. Goodrich Co., all of Akron, has accepted an indefinite leave of absence pending settlement of the Portage company's affairs.

The Goodyear Tire & Rubber Co., Akron, reports an increase of business beyond its expectations. At the Akron factories 25,000 automobile casings and 30,000 tubes are being produced daily, while at the California plant the record is 3,500 for a similar period. Sales to dealers surpass those of last year, while there is an improvement in the number of orders from automobile manufacturers.

L. H. Hopkins, formerly with the W. M. Pattison Supply Co., and F. B. Curran, formerly of the vulcanizing equipment department of the Akron Rubber Mold Co., Akron, have bought The O'Neil Tire & Rubber Co., 350 Bowery street, Akron, and will officiate as president and vice-president, respectively. The company is now building the O'Neil line of tire equipment exclusively.

A group of Ford Motor Co. dealers from Cleveland visited the Firestone Tire & Rubber Co., Akron, early this month. J. M. Bushey, manager of the Firestone branch in Cleveland, and K. D. Sheldon, Cleveland manager for the Ford Motor Co., piloted

the visitors through the plant and later through the Firestone Steel Products Co. plant. H. S. Firestone, president of the company, welcomed and accompanied the group through the factory.

CLEVELAND NOTES

The Cleveland Rubber Clearing House Co., 2006 East 46th street, Cleveland, Ohio, has been appointed distributer for Erie cord tires throughout northern Ohio. The officers are: Fred Dettling, president; J. D. Fackler, secretary, and J. C. McHannan, treasurer.

The National Tire Dealers' Association will hold its second annual convention at Cleveland, Ohio, from October 18-20. A special feature of the meeting will be a Tire and Accessory Show, arranged under the direction of R. F. Valentine, vice-president of the Association.

Newton D. Baker and E. S. Griffiths have been appointed receivers to continue the operation of the property of the Ideal Tire & Rubber Co., Cleveland, Ohio, by order of the United States District Court for the Northern District of Ohio. Eastern Division. No allegation of insolvency has been made and internal dissensions and business obligations are said to be the basis of the receivership action. The output has been increased under the direction of the receivers.

MISCELLANEOUS OHIO NOTES

The Mason Tire & Rubber Co., Kent, Ohio, has appointed E. W. McCreery manager of pneumatic tire sales and H. C. Geer manager of solid tire sales. Mr. McCreery has been eastern district manager for two years and Mr. Geer has been a special representative of the company in the solid tire department.

The Akron Universal Tire & Rubber Co., Medina, Ohio, has acquired the entire equipment of the Superfix Rubber Co., formerly at Elyria in the same state, and is now manufacturing "Superfix" rubber-fix in quantity. This company has also absorbed the Keck Manufacturing Co., West Unity, Ohio, and will manufacture the Keck safety tire boot, described elsewhere in this issue. The officers of the Akron Universal company are: C. R. Baker, president; R. E. Kimmell, vice-president; R. J. Hyde, treasurer, and E. J. Schwartz, secretary.

Production at The Erie Tire & Rubber Co.'s plant, Sandusky, Ohio, which began under order of court in March, 1921, is being maintained. Incidentally about 20 per cent of the indebtedness of the estate has been reduced through the operation of the receivership up to the present time. At the factory some new equipment is being installed, while building operations, which have been suspended since the latter part of 1920, are now being continued. Julian Victor has left The Cord Tire Corporation, Chester, West Virginia, and become associated with the Erie company.

Three rubber companies at Cuyahoga Falls, a suburb of Akron, have responded to the improved conditions and are either running full, or overtime. The Eclat Rubber Co. is working day and night shifts and its officers are considering the advisability of adding to factory space. The Marathon Tire & Rubber Co. is doubling production by increasing working forces and the Falls Rubber Co. has gone to full time.

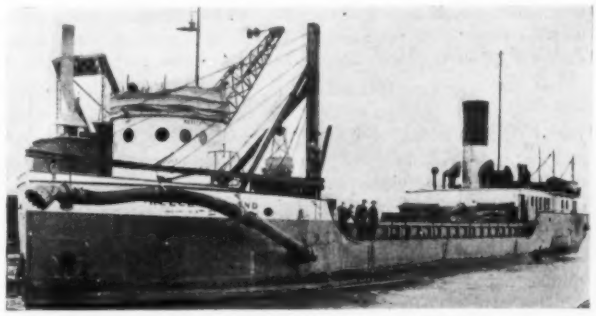
The Eclat Rubber Co. of Cuyahoga Falls, Ohio, early in the month shipped more than 400,000 radiator hose connections to the Ford Motor Co. It was necessary to operate the factory on a three shift basis and on holidays to complete the shipment in time.

REPUBLIC RUBBER CO. RESUMES PRODUCTION

C. H. Booth, who was recently appointed receiver of The Republic Rubber Corporation, Youngstown, Ohio, is also vice-president of The Republic Rubber Co., of Youngstown, and The Knight Tire & Rubber Co., of Canton. Mr. Booth reports that factory operations at the Republic plant in the manufacture of pneumatic tires, tubes and solid tires were resumed July 11, while in the departments for manufacturing mechanical goods work was again undertaken July 18. Operations, it is said, will continue for the present at about 25 per cent capacity.

SAND SUCTION HOSE

Pumping sand and gravel from the bottoms of rivers and lakes has developed into an industry of magnitude. All along our navigable rivers and the Great Lakes are boats which constantly requisition the bottoms of these streams and lakes for their cargoes. The sand and gravel is sucked up by big pumps through



SAND SUCKER FITTED WITH 30 FEET OF GOODYEAR 15-INCH SUCTION HOSE

a large suction hose. This hose is usually so large that it has to be made and joined together in sections, usually about ten feet long.

The boat in the illustration is the "Kelley Island," one of the sand fleet of the Kelley Island Lime & Transport Co., Detroit, Michigan. The boat has a carrying capacity of 900 cubic yards and requires about three hours for loading. Last season 216 cargoes were loaded through the big suction hose.

WHEELS MADE OF ALL HARD RUBBER

Wheels made throughout of "Garbonite," a new hard rubber, are claimed to be superior to wheels of wood and metal. They are made with rubber tires as an integral part of the wheel, which therefore cannot crack or come off. "Garbonite" wheels are supplied in any diameter from one inch upwards, and if required for heavy weights are bushed with steel or phosphor bronze. These wheels are being used for railroad platform trucks, electric platform wagons, every description of truck, wheelbarrows, hand carts, motor scooters, auto scooters, wheeled toys and extension ladders. They are being tested on motor cars and lorries with excellent results. Castors for bedsteads, furniture, pianos, cabin trunks, etc., are also being made of "Garbonite."—*The India-Rubber Journal.*

THE RUBBER TRADE IN THE MID-WEST

By Our Regular Correspondent

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION

THE regular monthly meeting of the Mid-West Rubber Manufacturers' Association was held July 12 at the Chicago Athletic Association. At this meeting Vice-President W. W. Wuchter presided, while short speeches were made by various members, including E. O. Sessions, of the Sessions Engineering Co.; L. A. Vaughn, of the Vaughn Machinery Co., and Sydney J. Roy, of the Hannibal Rubber Co.

As the Chicago meetings have met with such success it was proposed that regular monthly meetings be held at Omaha, St. Louis, Indianapolis, and other centrally-located cities. Mr. Roy advocated this plan, which was seconded by Mr. Sessions. The matter will undoubtedly come up for continued discussion at the August meeting when a large attendance is expected, as during that week the Pageant of Progress will be held in Chicago.

MISCELLANEOUS MID-WESTERN NOTES

The Link-Belt Co., Chicago, Illinois, has acquired all of the capital stock of the H. W. Caldwell & Son Co., and Frank C. Caldwell has been elected a director of the former company. Two experienced and successful companies in the conveyor world have thus joined forces, with the result that the Link-Belt Co. has added two new lines, helicoid conveyors and power transmission machinery, to its line of manufactures.

While there will be no changes in the product of the Caldwell plant, and no modifications in the policy of the company, it was believed that a consolidation of these two well-known firms would result in advantages to both. The management of the Caldwell plant is practically the same as formerly.

The Burdick Tire & Rubber Co., Chicago, Illinois, has placed with the Fort Dearborn Trust & Savings Bank, trustee, and James S. McClellan, co-trustee, a mortgage of $250,000 on its factory to cover an issue of first mortgage 8 per cent gold bonds to raise additional funds for increasing capacity and for operating expenses. H. G. Steinbrenner is president and F. E. Teachout is vice-president and general manager.

In order to avoid confusion with other companies having a similar name, the Independent Tire Co. has changed its name to The Better Tires Co. and is located at 2023 South Michigan avenue, Chicago, Illinois. The company acts as a jobber to distribute high-grade tires, tubes and accessories to small dealers in towns of less than 5,000 population where it is difficult and unprofitable for the average manufacturer to send a traveling salesman. The concern deals in "firsts" only and has built up a clientele of 4,500 small-town and rural dealers.

The Wildman Rubber Co., Bay City, Michigan, has contracted for the first unit of its new plant and will rush the building to completion at the earliest possible date.

The Altenburg Tire Equipment Co., Davenport, Iowa, has reorganized with V. D. Sears as president and sales manager; R. P. Hayes as vice-president and general manager. The new plant on Rockingham Road at the west end of the city has good railroad facilities and room for expansion. It is one of the most modern in the country, being well-lighted, and of steel frame, brick wall construction. The machine shop has two floors, the lower being used for large production machinery and the second for light assemblies, pattern shop and general office. The foundry is a complete unit with cupola and core ovens. All the buildings have concrete tile roofing and are fireproof. The principal product of the plant will continue to be tire-building and tire-repair equipment.

The Non-Breakable Button Corporation, 200-210 Pleasant street, Milwaukee, Wisconsin, recently incorporated, manufactures high-grade rubber buttons and novelties. The buttons are non-breakable and are not affected, it is claimed, by the laundry wringer, mangle, electric iron, hot water and acids, soaps and soap powders. The thread cannot cut the button-hole, nor will the button-hole cut the thread. The buttons will be made at first in white and khaki in four sizes. The equipment installed will produce 360,000,000 buttons annually. Details concerning incorporation are given elsewhere in this issue.

The George G. Bryant Co., manufacturer of top coats, gabardines and rain coats, has removed to 134 Second street, Milwaukee, Wisconsin. This firm is the western agent for the "Bestyette" products of the New York Mackintosh Co., New York, N. Y.

ACTIVITIES OF THE MOTOR AND ACCESSORY MANUFACTURERS' ASSOCIATION

This year's credit convention of The Motor and Accessory Manufacturers' Association will be held in Detroit, Michigan, at Hotel Statler, September 14-16, inclusive. E. H. Broadwell, president of the Association and vice-president of The Fisk Rubber Co., will preside, while there will also be speakers of national importance from the automotive industry and from industrial, banking and governmental circles. Details regarding the program of the coming convention will appear later.

Following the organization of the Sheet Metal Manufacturers as its first unit, a new group plan of the Association is now under consideration. Under this arrangement the four hundred companies now affiliated with the Association will be divided into a number of groups, each comprising manufacturers of the same products, and each having officers and meetings of its own, but for general purposes affiliated with the parent organization.

It is believed that the establishment and centralization of these groups, based on the classification of the products they manufacture, will make for a greater unity of purpose in the direction of economies of production and distribution, thus eliminating duplication of effort and expense.

THE RUBBER TRADE ON THE PACIFIC COAST

By Our Regular Correspondent

WARMER weather along the Pacific Coast recently has had but little effect on the demand for various kinds of mechanical rubber goods, orders being well sustained. This is due largely to the continued activity of building operations, most of the large cities making a much better per capita showing than the eastern cities. A lull in labor troubles, and the prompt settlement in the Northwest of several incipient strikes over wage reductions having a salutary effect on trade in general, a good inquiry is reported for rubber and balata beltings, sheet packing, asbestos-rubber brake and clutch blocks, steam, air, garden, and oil hose, rubber footwear, soles, heels, surgeons' and druggists' hard and soft rubber goods, acid and cement workers' gloves, automobile top fabrics, and miscellaneous hard rubber articles. Sales of tires and tubes continue to mount in number, and the lively demand and well-sustained prices impel the makers to predict a good trade in both automobile staples until well toward the end of the year.

LOS ANGELES AND VICINITY

A fair index of the trend in the tire trade is afforded by the operations of the largest factory on the Coast, the Goodyear Tire & Rubber Co. of California, at Los Angeles. The factory's July schedule was set for 3,500 tires and 3,700 tubes a day, or an increase of 375 per cent since last March. In March the rubber and textile mills employed only 465 people and the tire output fell to 735 daily, but in the month just ended 1,250 were at work in the mills. Although June, 1920, had been considered one of the peak months for the California company, with a total of 32,654 casings sold to dealers in the western territory, June, 1921, showed sales of 42,266 casings, or an increase of 13,612.

Another comparison may be made with the total sales for the fiscal year ended July 1, 1920, of 291,666 automobile tires as contrasted with total sales for the year ended July 1, 1921, of 348,992 tires. The gross sales for June, 1921, of automobile and truck tires, mechanical goods, accessories, and repair materials, reached over $1,300,000.

The Goodyear Textile Mills, operated in conjunction with the rubber plant, had a production schedule for July of 200,000 pounds of fabric, for August 250,000 pounds, and for September 270,000 pounds. From August 1, 1920, to June 30, 1921, the mills produced 1,252,489 pounds of fabric and used 3,108 bales of long-staple cotton, valued at $966,000, all the cotton coming from the Salt River Valley, Arizona, and the Imperial Valley, California.

Vice-president and general manager A. F. Osterloh, sales manager J. R. Reilly, treasurer W. A. M. Vaughan, and factory superintendent C. Slusser, of the California Goodyear plant, have been attending a conference at Akron, Ohio, called by E. G. Wilmer, president of the parent company, to consider increasing production. Mr. Reilly estimates the value of sales for the three months ending September 30, next, at $4,250,000.

Another cut in Goodyear tires in the west-coast states has been announced. The 30 by 3½ single cure clincher tire is now selling at $13.95.

The Owen Tire Co., Cleveland, Ohio, is reported to be negotiating for a site for a Pacific Coast branch factory, at which not only tires and tubes but also tire fabric will be manufactured. W. C. Owen, president of the concern, has been in touch recently with Los Angeles interests concerning the project, and it is said that if satisfactory arrangements can be made, a plant investment of $1,000,000 is likely to be made and employment probably given to 2,000 people.

The Daly Company, Inc., 1027-1029 Santa Fe avenue, Los Angeles, is about to establish a branch factory in Detroit, Michigan, for the Daly Simplex rim, which is being made a part of standard equipment on many well-known makes of automobiles. The manufacturers claim that tire changing, usually an irksome task, is made very easy with their new rim, a tire being removed and replaced in the rim in fifteen minutes by pulling a lever; and that old rims can be readily fitted with the new device.

Rubber manufacturers on the coast are much interested in a report that a very large concern is about to be established, possibly at Los Angeles, for the weaving of sheetings, Osnaburgs, and other textiles from southwestern long-staple cotton. A survey of coast trade conditions, with a view toward the setting up of such an industry, has been made recently by William R. Berryman, of New York, who is said to represent large textile interests.

The California Wire Co., of which Louis Koth, formerly manager of the Illinois Wire & Cable Co., Sycamore, Illinois, and now a resident of Orange, California, is president, has been formed with $200,000 capital to manufacture rubber-covered electric wire and cable. The plant, which will be at Orange, near Los Angeles, will cover 2½ acres and employ a large force. It is said to be the first insulated wire factory of its kind west of the Mississippi. Fred H. Alden, formerly sales manager for the Sycamore concern, will have charge of the new company's sales. Codirectors with Mr. Koth are F. W. Struck, F. A. Grote, William King, and W. C. Matthias.

SAN FRANCISCO NOTES

The appointment of George L. Hurst as the Pacific Coast representative of the Birmingham Iron Foundry, Derby, Connecticut, has been recently announced. Mr. Hurst has had a wide experience in the matter of designing, constructing, and selling machinery and will handle the well-known products of the Birmingham Iron Foundry at the San Francisco offices, 544 Market street.

The Mason Tire & Rubber Co., Kent, Ohio, is opening a new sales office on Van Ness avenue, San Francisco. R. D. Thomas, a well-known San Francisco man, has been placed in charge of this branch, with Henry Suersted, formerly of the Republic company, as his assistant. A complete stock of tires and tubes will be carried, while the modern equipment now being installed will afford car owners expert service.

SOUTHWESTERN NOTES

William McCallum, of the Continental Rubber Co. of Arizona, recently inspected the guayule rubber plantation at University Farm at Davis, California, and found the young plants in a flourishing condition. Other guayule demonstrations are being made near Escondido in San Diego county and in the Salinas Valley, and good progress is being made in both places, it is stated. The Continental company has two commercial plantings of guayule transplanted from Mexico, one of 200 acres, near San Jacinto, California, and the other of 600 acres, near Continental, Arizona, and both are developing well, it is said. The latter is expected to be yielding rubber within a couple of years.

What is giving the tire men considerable concern is the shortage that looms in the supply of cotton. Last year the cotton acreage in Arizona was 165,000, but this year it is scarcely 50,000, the farmers who produced too much cotton last year having turned to diversified crops as involving less hazard. Local and Los Angeles banking interests have arranged to finance the 1921 crop after getting assurance of greatly reduced acreage.

Recent estimates give the total amount of cotton stored in the Yuma and Salt River Valleys, Arizona, and the Imperial and San Joaquin Valleys, California, as 225,000 bales with an approximate value of $22,500,000.

A colloidal clay, said to be similar to, if not identical with, a mineral substance much used as an accelerator by English rubber manufacturers, has been discovered in the Mojave Desert in the eastern part of California. The California Master Products Co., of Slauson avenue and Alameda street, Los Angeles, has taken title to 500 acres and has set up a plant on the desert to mine the clay, which is also being used in soap making. The president of the concern is L. F. Caswell.

The India Tire & Rubber Co., Akron, Ohio, has opened a direct factory warehouse in Dallas, Texas, where a supply of all rubber products, including a complete line of giant pneumatic truck tires, will be constantly kept in stock. Harry L. Corbett, formerly with the Norwalk Tire & Rubber Co., will be in charge of this new distributing warehouse. C. V. Moore and J. Y. McKinney, also previously associated with the Norwalk company, and L. G. Trench will act as Mr. Corbett's assistants.

NORTHWESTERN NOTES

The Portland Rubber Mills has changed its name to the Huntington Rubber Mills, with address at 1580 Macadam street, Portland, Oregon.

The largest tire repair shop in the Pacific Northwest, the only one featuring a drive-in, and the most completely equipped in the territory, are the claims made for the new home of Coffey & Conway, 27 West Park street, Portland, Oregon, by Ray Conway, head of the concern and president of the Portland Rubber Workers' Club. The two stories of this building are fitted up with the latest improvements, while the equipment is modern in every respect.

BUS LINES SHOW PROFIT

The following figures were compiled from accurate cost records of operating the Goodyear Heights bus line by the Goodyear company and cover a period of 37 months ended December 30, 1920.

During the 37 months under consideration a total of approximately 4,500,000 passengers were carried at five cents each. Net profits are figured at $23,991.10 or $.0052 per passenger. Total revenue is given at $237,846 and total operating expenses at $213,865.

COST OF OPERATING

	Totals	Per Bus Mile
Gasoline	$28,514.34	$0.0475
Lubrication	6,678.49	.0115
Tires	32,960.07	.056
Drivers' wages	53,733.75	.0914
Maintenance, labor and materials	27,086.00	.046
Miscellaneous expenses, including administration	17,109.57	.929

Insurance, public and liability, cost $6,613.26, garage rent, $2,-114.32, and licenses together with interest on investment at 6 per cent amounted to $6,433.96. The total profit per passenger is given in the report at $.0052 and the total cost at $.0448 per passenger.

The company started with an investment of $6,075 and the total investment for the three years amounted to $90,838. Depreciation charged to operation amounted to $32,620 and depreciation charged to investment amounted to $49,645. During 1918 the bus equipment was in use 91.5 per cent of the available time, in 1919, 65 per cent, and in 1920, 46 per cent of the time.

TIRE FACTORY REPAIR SCHOOL

An advantage that tire-repair concerns in the Southwest appreciate is the training school conducted by the Goodyear company at its works in Los Angeles and now about a year in operation. Such excellent training do the students receive that they find good-paying jobs without trouble. Tuition is entirely free, and the minimum course is three weeks, in which time the

TIRE REPAIR SCHOOL IN THE GOODYEAR FACTORY AT LOS ANGELES.

students learn how tires are made, why they get damaged, the use of tools and repair material, how to fix sand-boils and tread-cuts, how to do lay-back repairs, mend blow-outs, fix injured beads and sidewalls, do retreading, relining, tube and casing sectional repair, how to handle cord tires, how to manage a vulcanizing apparatus, etc., practical working conditions in a first-class repair shop being fairly duplicated.

The aim of the manager of the school, J. R. Wells, is to fit the graduates not only for employment with others but also to set up business for themselves. Classes start every Monday morning, and the enrollment is steadily increasing, many of the pupils coming from several hundred miles distant, and the majority attaining remarkable proficiency in a very short time.

THE GREGORY TIRE & RUBBER CO., LIMITED

The Gregory Tire & Rubber Co., Limited, Vancouver, British Columbia, sends a most optimistic report regarding its new plant, where the demand is ahead of the production.

PLANT OF THE GREGORY TIRE & RUBBER CO., LIMITED

The city of Vancouver presents an encouraging field for the automobile dealer or manufacturer, as the city ranks second among Canadian towns for the number of cars used, while the climate permits the running of cars the year round.

A note regarding the new Gregory plant, with the names of the officials of the company, appeared in THE INDIA RUBBER WORLD, May 1, 1921.

NEW TYPE REMOVABLE TRACK UTILIZES RUBBER BELTING

Previous attempts to use caterpillar tracks have been ordinarily confined to low-speed agricultural purposes, where high speeds were difficult to maintain, due to wear upon the track itself. A type recently developed has attained a maximum rate of 37 miles an hour on good roads, the highest speed, so far as is known, yet reached by a track-laying type of vehicle.

The equipment was developed for the Tank, Tractor and Trailer Division of the Ordnance Department, Washington, D. C., by A. M. Chase, who is in charge of its Syracuse engineering office. In this new device, for use with a Ford car, each track consists of two rubberized fabric belts which are connected by steel stampings riveted to the belts, the ends of the stampings being turned over to form a guide into which the tires fit.

In addition to the regular wheels of the car there are provided four extra ones, two on each side, of the same size as the regular wheels and located between the front and rear regular wheels. These extra wheels serve as carriers, the track under the regular wheels being normally off the ground. Standard regular 3½-inch pneumatic tires are used, and after 1,300 miles of operation, under conditions which would have damaged the tires of a regular Ford car, the tires and fabric track appeared in excellent condition. For travel in deep snow, over plowed ground or in deep mud, a commercial auxiliary transmission, which doubles the gear reduc-

U. S. Ordnance Department.

THE CHASE CATERPILLAR TRACK

tion, is introduced in the drive-shaft, directly in front of the rear axle housing. For operation on improved roads the regular Ford ratios are used.—*Automotive Industries.*

FULL TIRE INFLATION IMPORTANT IN SUMMER

Tires should be inflated to the same recommended pressure in summer as in winter. The expansion of the air in tires, even in the hottest weather, is so slight that it should be entirely disregarded. Experience shows that most of the heat generated in a tire is due to the internal friction of constant flexing, and increases with the degree of underinflation. By reducing pressures, the increased flexing of the tire creates the very condition which the car owner wishes to guard against.

A test made on a 5-inch cord tire run at 30 miles an hour for two hours at the standard 70 pounds air pressure, with the temperature of the air 62.6 degrees F., increased the temperature of the tire to 86 degrees and the pressure to only 75 pounds. For 23 degrees increase in temperature, pressure increased only 5 pounds. To obtain an increase of 15 pounds pressure, it would be necessary to have a temperature increase of 70 degrees over normal. This, of course, is improbable and clearly proves that the motorist has little to fear from increased temperature. Other tests have shown that it is possible to double this increase in temperature by cutting the normal inflation pressure in half.

The International Rubber Exhibition

THE Fifth International Exhibition of Rubber, Other Tropical Products and Allied Industries, was opened in London, June 3, by Sir Owen Phillips, G. C. M. G., M. P., in the presence of a large and distinguished gathering representative of all parts of the British Empire and many foreign countries.

EXHIBITION MARKED GREAT ADVANCES

The exhibition drew a large and interested attendance of spectators each session. In addition to the display of standard crude rubbers, manufactured products and rubber-making machinery, chemicals and ingredients, the notable feature of the exhibition was the marked advancement in processes and products since the last exhibition, notably gas-cured and gas-filled rubber, the rapid preparation of crude rubber from latex, and rubber flooring.

THE PEACHEY PROCESS

Prominent among the new developments was the gas cold cure of the Peachey Process Co., Limited, explained by Messrs. Peachey and Herring-Shaw. Fabrics and other rubber products cured by this process elicited much enthusiasm from the visitors to the exhibit, which was one of the popular attractions of the show.

EXPANDED RUBBER

The display of expanded rubber product made by Onazote, Limited, was also a center of great interest. The material known as "Onazote" is a remarkable new development in rubber foam expanded with nitrogen gas under a process patented by C. L. Marshall. The material is considered to have great possibilities in its applications, due to its structure and internal gas pressure. Among the more obvious of these uses are floats for various purposes, padding and cushions for seats, balls, tire-filling and floor-covering. In the latter use a good thickness of the expanded rubber is provided between two substantial skins, which take the abrasive wear.

"The Rubber Age," London.

GENERAL VIEW OF THE EXHIBITION

RUBBER FLOOR COVERING FEATURED

Throughout the exhibition and, in fact, throughout the trade today, there is evidence of a great revival of interest in applications of rubber floor-covering. The North British Rubber Co., Limited, are the pioneers of rubber flooring in roll form. Their "Paraflor" rubber flooring is a most attractive article and, wearing quality considered, it compares favorably with linoleum in price. The Peachey Process Co., Limited, showed fine samples of rubber flooring in colors produced by their curing process.

Rubber tiling, with slots and keys, on a new interlocking principle, was shown by the United Dutch Rubber Works, Limited.

CRUDE RUBBER PROCESS

The Davidson process of manufacturing crude rubber from latex was demonstrated by working models of the complete plant. Rolls of perfectly dry rubber were produced from the latex in 25 minutes from start to finish of operations.

A special preservative known as "Siroxidine" is employed to preserve the fresh latex in fluid condition for an indefinite length of time. Should a big demand develop for crude latex in Europe or America, there would apparently be no diffculty in shipping it in tank steamers for further treatment by the special coagulant and machinery comprised in the process.

BRAZIL'S EXHIBIT

Prominently displayed on the splendid stand occupied by the Government of Brazil was the following notice: "Rubber production being absolutely unprofitable at present prices, Pará and Amazonas are changing over to other production, as timber, vegetable oils, tanning and coloring materials, besides nuts and cocoa, which always formed an important item in the Amazon exports."

The Brazilian exhibit as a whole was one of the most attractive in the exhibition. Particular admiration was evoked by the collection of native Brazilian timbers.

PROMINENT EXHIBITORS

Among the prominent American exhibits was that of the Hunter process of conditioning rubber, which employs the natural element of humidity in combination with the proper temperature in circulation, shown by Francis Shaw & Co., Limited, Manchester, England. This company specializes in plantation and rubber manufacturing machinery, and is the British representative of the Hunter Dry Kiln Co. As this simple and practical method of improving the compound attracted so much favorable attention, its adoption in a number of British plants will probably follow.

North British Rubber Co., Limited, Castle Mills, Edinburgh, made a most attractive show of its general line, including mechanical goods, footwear, clothing, sporting, air and surgical products. Distinctive and popular features of this exhibit were the "Paraflor" rubber carpeting and the "Clincher" golf balls, both of which attracted a great deal of attention. It was, beyond any question, one of the most comprehensive and effective exploitations of the show.

Pirelli & Co., Limited, the prominent Italian manufacturer of electric cable, india rubber, gutta percha products and pneumatic and solid tires for motor cars, cycles, etc., made a most effective show, which, by the way, also included mechanical and surgical goods as well as clothing and sporting effects.

The "Pirelli" solid twin tire on one band was the subject of much interest. It is built up with an open V to prevent stones, etc., from being caught up and embedded in the rubber. The two tire sections are designed to take the camber of the road.

An interesting exhibit was that of Alfred Smith, Limited, Clayton, Manchester, who exhibited its lines of substitutes and accelerators. "Velosan," one of the company's prominent specialties, is in active request among rubber manufacturers every where. Alfred Smith, Limited, was established in 1856.

Typke & King, Limited, had a very attractive stand in which were exhibited the company's various lines of antimony sulphides, substitutes, mineral rubber and a general line of compounding ingredients used in rubber manufacture. The "T & K" trademark is accepted as a quality standard among rubber manufac-

turers all over the world, and has been so regarded for nearly half a century.

Among the prominent producers of reclaimed rubber exhibiting was the North Western Rubber Co., whose product is of international repute and in active request where rubber manufacture is an important industry.

Shortly before the close of the exhibition the trophies, medals, and other prizes were presented to the winners by Professor Wyndham R. Dunstan, president of the exhibition. A complete report of the awards will be published in a forthcoming issue.

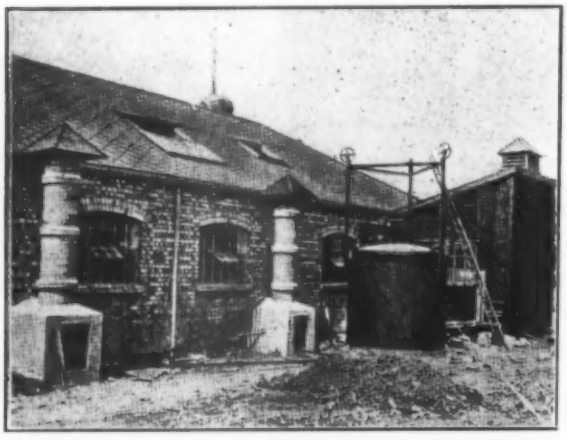
PEACHEY PROCESS DEMONSTRATION PLANT

AN experimental plant and laboratory has been installed by The Peachey Process Co. at 380 Highroad, Willesden, London, N. W., and it is now in successful operation for the demonstration of the process in all its adaptations. The process was made one of the features of the recent Fifth International Rubber Exhibition in London.

The Willesden plant is equipped with mixing and calendering machinery, stationary curing pans and a series of vertical chambers for continuous curing of material in long lengths. As is well known, the process effects vulcanization without heat or pressure by exposing the rubber, first to sulphur dioxide gas, and then to hydrogen sulphide. The former is purchasable in liquid form in steel cylinders. The latter is made in a gas-producing plant on the premises from iron sulphide and hydrochloric acid and stored in an oil-sealed gas holder.

OPERATION OF PROCESS

The process as applied in the stationary pan consists in placing the articles on wooden racks in the pan, which is then tightly closed. Separate inlets are provided for the admission of each gas to the pan, and an outlet connected with an absorber outside the plant. To effect the cure sulphur dioxide under the required pressure is admitted to the pan for ten minutes to saturate the rubber. The excess gas is then expelled by compressed air,

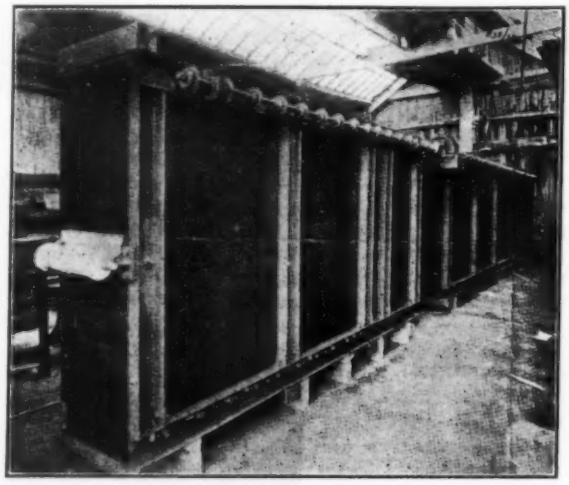


VIEW OF GAS ABSORBERS

and hydrogen sulphide is admitted and held for 30 minutes to finish the process of curing, no heat or extra pressure being required.

CONTINUOUS VULCANIZATION

The chambers for continuous vulcanization are so arranged that the rubber-coated materials enter at one end of the apparatus, passing first through a chamber, festooned over rollers geared to run at the same speed to avoid strain on the fabric. The rate of passage through the apparatus is such that during its passage from entrance to exit the rubber is fully cured. The material having been saturated with sulphur dioxide in the first chamber enters the second, or air chamber, to prevent any sulphuring, and then passes through the third chamber similar to the first. Its passage through this chamber is three times as long as through



APPARATUS FOR CONTINUOUS VULCANIZATION

the first, as the chamber is fitted with more festooning rollers. By this means the exposure to each of the gases is properly timed. From the last chamber the fabric is received on a suitable wind-up roller in a finished condition.

ANNUAL REPORT OF THE STRATHMORE RUBBER CO., LIMITED

The Strathmore Rubber Co., Limited, 46 Charlotte Square, Edinburgh, was incorporated March 27, 1920, taking over the business of the former company of the same name. From the report of this firm for the year 1920 the following items are taken:

The total acreage of the rubber estates in the Federated Malay States is 2,334 acres. The yield of rubber has been satisfactory, and the factories are reported in excellent condition. A substantial part of the year's crop was sold for delivery at Singapore. The acreage planted with Hevea rubber is as follows:

When Planted	Strathmore Estate Acres	Ulu Buloh Estate Acres	Sungei Rawang Estate Acres	Totals Acres
In bearing:				
1906 to 1914.....	580	732	....	1,312
Not in bearing:				
1915	....	90	....	90
1916	....	115	207	322
1918-19	....	....	295	295
1919 (Decrease)	....	....	253	253
Total planted.....	580	937	755	2,272
Unplanted area (including building sites, etc.)	4½	50	7½	62
Total acreage	584½	987	762½	2,334

For purposes of comparison with the results obtained by the old company during the previous five years, the following statement of figures is given:

Year	Crop, Lbs. Dry Rubber	Gross Average Price Realized per lb.	Cost of Production, f. o. b. per lb.	Selling Charges, Including Freight and Insurance, per lb.	Administration Expenses, Including Directors' Fees, per lb.	Cost of Production "All in," per lb.	Profit for Year, Before Paying Income Tax.
		s. d.	s. d.	s. d.	s. d.	s. d.	£
1915	367,656	2/7.45	7.60	1.73	.08	10.01	34,063
1916	427,034	2/6.12	6.91	1.49	.78	9.18	38,838
1917	437,403	2/3.19	9.20	1.71	.73	11.64	29,829
1918	349,773	1/9.08	11.20	1.52	.98	1/1.70	12,032
1919	458,908	1/10.16	9.23	1.12	.73	11.08	21,591
1920	473,890	1/6.15	10.15	1.70	.85	1/0.70	11,311

The Rubber Trade in Great Britain

By Our Regular Correspondent

FROM the Government's reply to the representations of rubber-growing interests in the Far East, it is clear that no imperial assistance or support is to be expected with regard to rubber production control. Like the coal and other home industries, it is obvious that the rubber-growing industry will have to work out its own salvation. Meanwhile, the passing of dividends is a somewhat serious matter to numerous shareholders who bought the shares as investments and it is natural that uneasiness as to the future is widely prevalent. Shares generally are about at their worst and it is difficult to justify any material recovery.

In some of the papers too much is being made of the failure of the United Malaysian Rubber Co., Limited, with liabilities of about £2,000,000. It will be remembered, however, that this is not a rubber-growing company but one of the rubber boom flotations for deresinating jelutong, and was chiefly remarkable for the presence on its board of a Vanderbilt and a Goelet.

COAL STRIKE AT AN END

The coal strike has at last come to an end, though it will be a few weeks before supplies are normal. The lifting of the dockers' ban against handling foreign coal on June 1 led to the immediate discharge of some American coal vessels, chiefly gas coal, at our northern ports, and the arrival of several more cargoes has eased the position appreciably.

It would be foolish, however, to imagine that the end of the coal strike, coupled with the fall in the bank rate, will cause any real revival in the rubber trade. This no doubt will come, but there are no signs of its imminence. With regard to the waterproof trade, the general absence of rain during the first half of the year has added another adverse factor to those already existing.

EFFECT OF THE UNITED STATES TARIFF BILL

The United States Emergency Tariff Bill, as far as its anti-dumping section is concerned, has been somewhat severely criticized on this side by anti-protectional interests. It is all very well to talk about cost of production, sale price and so on, but these are only relative and cannot be closely defined. The opinion has been expressed that the act will either become a dead letter after having served its electioneering purpose or it will put an end to a large volume of trade with the United States.

The fact is that the only reason a country imports any article is that it is cheaper or better than the home-made article and the whole of international trade and exchange rests on this basis. A straight tariff is workable, but one depending on relative and fluctuating prices seems on the face of it to be an absurdity in international trade. Of course, England proposes to do much the same thing and the proposals are meeting with a good deal more opposition in Parliament than appears to have been the case in America.

POSITION OF BRITISH TIRE MANUFACTURERS

With regard to the British tire manufacturers' position a memorandum has been circulated by the Association, drawing attention to the parlous position of the industry, this being largely attributed to the import of foreign, mainly American, tires duty free. It is stated that the capital involved in the industry is about £25,000,000 and direct employment is given to 30,000 work people, many others also being dependent on it in subsidiary industries. It is urged that unless immediate protective steps are taken the future of the industry will be most precarious. It seems to be the fact that the continental business done this year has not been a financial success, owing to the adverse exchanges, while with regard to America where the exchange favors England, the inability of British tire manufacturers to supply cord tires has been against an increase of business.

ONAZOTE

This seems to have attracted a good deal of attention at the Rubber Exhibition on account of its being a complete novelty. With regard to the origin of the name, this may be derived from "ezote," the old name for nitrogen. The substance is an expanded or cellular rubber made under high pressure, and the gas appears to be kept in by a vulcanized external skin of ordinary rubber. It is patented by C. L. Marshall, British patent No. 162,176. Unlike the manufacturers of unburstable balls, Mr. Marshall has patented his invention and the ball manufacturers are in a position to see how near his formula and procedure resemble their own. A company has been formed with the not excessive capital of £25,000 to work the process under license, the new works being situated at 38 Harlesden Road, Willesden Green, N. W. 10.

HARD RUBBER CARBOYS

Among the new goods and specialties referred to in the June issue of THE INDIA RUBBER WORLD, there is an illustration of a 29-gallon carboy of hard rubber made by a prominent American hard rubber company. It is stated that such carboys have been used successfully for the conveyance of corrosive acids and alkalies, and it would seem that their wider adoption would add to the public safety. There have been at least two cases quite recently in England where a collision has caused carboys of vitriol to be broken and to cause serious damage to people in the vicinity. Although glass has gone up in price and rubber down, it is presumed that the hard rubber carboy would still cost a great deal more than its present competitor, but this is a matter that might right itself where compensating advantages are duly recognized. However, the matter is of sufficient importance to English carboy users to warrant the hope that the publicity given to the new carboy in England is not limited to the circulation of THE INDIA RUBBER WORLD.

THE RUBBER CLUB OF GREAT BRITAIN

After a good deal more delay than the original promoters anticipated the Rubber Club has been formed, the deciding meeting having been held at the Rubber Exhibition. By the poor response from the trade it was clear that the subscriptions for the different classes of members were considered too high, and it is generally admitted to have been a wise move to reduce them to the following scale: full members (manufacturers) £5/5*s.* 0*d.*; merchant members, £2/12*s.* 6*d.*; associate members, £1/1*s.* 0*d.*; and student members under 21 years of age, 10*s.* 6*d.* These subscriptions will no doubt be considered quite high enough for those who live at a distance from the two proposed centers of activity, London and Manchester.

An eminent rubber chemist whose business premises are located a mile or so away from the Rubber Exhibition mentioned with a tone of regret that H. C. Pearson, and various others who live at a greater or lesser distance, failed to put in an appearance. Londoners do not always appreciate to the full the great advantage they enjoy in having international exhibitions and the headquarters of all societies of importance so easy of access. Compared with their country cousins, they are in a highly favored position and the thought occurs that, to a great extent, the Rubber Club of Great Britain will be the Rubber Club of London as far as attendance at meetings is concerned.

Passing to another topic, it now seems to be openly acknowledged that the leading rubber manufacturers, for reasons I am

unacquainted with, have not sent in applications for membership and it remains to be seen how the project will succeed without their support. Times certainly are bad but this abstention cannot be attributed solely to a desire to save the amount of the subscription and it may be permissible to hazard the conjecture that the altruistic ideals of the promoters have not met with universal acceptance in the minds of business men.

THE PROFITEERING ACT

Although this act is now deceased, interesting sidelights in the conduct of various business are now appearing as the result of the labors of various sub-committees. In contradistinction to what was found in the case of soap, woolen clothing, etc., it is recorded that the rise in prices of the products of the Cable Makers' Association was not unwarrantable under the existing circumstances. As an offset to the fall of 50 per cent in rubber, metals, paper, etc., showed a large rise in price and then, of course, there is labor now about 200 per cent above what it was in 1914. In addition to the Cable Makers' Association, there are the Telephone Cable Makers' Association and the High Conductivity Copper Association, all of whom are in league to a certain extent. The report testifies that they have not abused their monopolistic position though this may be due to some extent to the fact that some old-established firms still remain outside the Cable Makers' Association and can charge their own prices which would appear to be, as a rule, somewhere about 10 per cent below those of members of the Association, the goods, of course, not bearing the special guaranty of the Association.

FIRESTONE'S EUROPEAN MANAGER

Few more romantic situations can be conceived of than that of Colonel Speaks who, a short time ago was traversing the war-torn fields of France in the Quartermaster's Department of the United States Army, but at present is covering the same district as European manager for the Firestone Tire & Rubber Co., with headquarters in London, England.

CHARLES E. SPEAKS

In 1915 Mr. Speaks was appointed manager of the Firestone motorcycle tire department, and two years later was made manager of truck tire sales. From this post he went into his country's service and was advanced from captain to colonel in the short span of two years. Attached from the first to the transportation divisions, he was in charge of the operations connected with getting supplies to the troops. Later, as repair problems and depots of supply forced themselves upon the general staff, Colonel Speaks assumed even more important duties, assisting in the rehabilitation of the devastated country.

Following his return to his former position in the Firestone organization, the value of his experience in France was recognized and he has been given important duties in the furtherance of peace-time commerce and will make a study of selling goods in the more important European nations.

RUBBER GROWERS PLAN FIFTY PER CENT REDUCTION

At a recent meeting of the Rubber Growers' Association, 38 Eastcheap, London, E.C.3, England, the following resolutions were carried:

(1) That the revised draft scheme for a "Rubber Producers Corporation" submitted to this meeting be adopted as the proposal of this Council and that the Output Control Committee be empowered to take steps with all speed to secure the support necessary to make the scheme effective, with discretion to make such amendments in the scheme as may be found necessary.

(2) That in view of the imperative necessity for an immediate reduction of output by at least 50 per cent and having regard to the delay which will necessarily ensue before the scheme for a "Rubber Producers Corporation" can become operative the Council recommend all producers of plantation rubber, who have not already done so, to take the necessary steps to bring such reduction of output into effect immediately.

THE RUBBER TRADE IN EUROPE

By a Special Correspondent

FRANCE

The Société Commerciale du Caoutchouc, Paris, reports that net profits for 1920 were 670,864 francs against 853,036 francs the year before. A dividend of 8 per cent was proposed as compared with the dividend of 15 per cent for 1919.

Etablissements Isol, 78 rue de Wattignies, Paris, is a new firm which will manufacture and sell all kinds of insulating materials, including those with a base of rubber, particularly molded goods in soft or hard rubber. The capital has been fixed at 700,000 francs. The first directors are Henri Lejeune, Romano Scheu, Maurice Abenheimer and Edouard Moreau, all of Paris, and Jacques Mirault, of Chatillon-sur-Indre (Indre).

Under the name of Herteaux et Cie., a new company has been formed with headquarters at 17 rue Lannois, Levallois-Perret, to manufacture and represent all kinds of rubber goods for automobiles. The capital is 200,000 francs.

P. Lacollonge, Lyon, is a new firm which will operate a factory at Villeurbanne where all kinds of rubber goods will be produced.

It is reported that at an extraordinary general meeting of the Manufacture Parisienne de Caoutchouc, recently held, the liquidation of the company was decided upon. M. Jehan Pottier has been designated liquidator and all necessary powers have been given him, especially for the purpose of bringing over a part of the assets to a new company.

An international investment trust dealing in rubber enterprises is the Société Financière des Caoutchoucs (capital 40,000,000 francs), in which are involved the Banque de l'Union Parisienne, the Union Financière de Génève, Bungé and Co. of Antwerp, and other Dutch and British firms. This company has itself organized twelve subsidiary companies, and holds stock in some thirty others.

Another investment trust of colonial interests and international scope, organized under Belgian law and directed by Belgian initiative, is the Société Internationale de Plantations et de Finance (Sipef), with which the Bungé and Grisar groups at Antwerp are closely connected. Its capital of 25,000,000 francs is held largely in Belgium, though Swiss and Dutch banks were also subscribers. The company controls, among others, such important enterprises as the Federated Malay States Rubber Co. and the Kuala Lumpur Rubber Co.

LYON SAMPLE FAIR TO BE HELD IN OCTOBER

An excellent opportunity for American rubber manufacturers to reach foreign customers, and to keep in touch with new developments will be afforded by the Lyon Sample Fair, which will be held October 1-15, inclusive. At the spring fair held in March, 1921, fourteen countries were represented, while the daily attendance was very large. Information as to details can be obtained from Emile Garden, official delegate for the United States, 150 Nassau street, New York, N. Y.

GERMANY

Tariff reform seems to be the order of the day all over the world, and Germany, too, apparently intends to revise her tariff, and that upward. So far as the countries of the Entente are concerned, Germany is bound by the provisions of the treaty of Versailles. But with regard to other countries she is in a more favorable position. Tariff obligations with Austria have already ceased and recently the German Government notified the Swiss Government that the tariff convention with Switzerland would terminate July 1, 1921.

Apropos of tariffs, German exporters have been more or less perplexed by contradictory statements made in the Reichstag with reference to the refunding by the German Government of the Rhein duty leviable by the Entente. On May 20, it was announced that the Government would refund to exporters the amount of duty leviable by the Entente and that payment would be made in paper marks. On May 31, a semi-official statement was published stating just the contrary and giving German business men the impression that the Government considered that trade interests should look after themselves. However, the latest report is that the Chancellor confirmed before the Reichstag the first declaration, adding that payments in paper marks would begin after certain necessary preliminaries had been gone through.

From an item in the *Gummi-Zeitung* of June 3, it seems that certain exporters are trying to shift the burden of the Entente duty onto the importers and are quite frank about it. At any rate, offers have been received in Sweden, with prices subject to change, as the amount payable to the Entente had not yet been fixed. Naturally, Swedish importers are highly indignant at this procedure and declare that as soon as they can get the required goods from England, France and the United States, they will no longer look to Germany for them. As they say with truth, they owe the Entente nothing, and do not see why they should be required to pay Germany's debts. The writer of the article warns German business men of this attitude and seems to be as disgusted with their methods as are the Swedish importers.

A NEW HOLE IN THE WEST

The new "hole in the West" through which large quantities of goods are entering Germany, is causing anxiety in certain German circles. Rubber goods also find their way into the country and in the first ten months of this year the quantity of these articles, chiefly tires, amounted to 18,900 quintals—one quintal equals 220.46 pounds.

The impression got abroad that Germany, long starved for rubber goods, was a good field for export. And now, in spite of the prohibition of the importation of rubber manufactures, tires to a value of millions of marks are finding their way on the German market, much to the alarm of those interested.

Dealers are bitterly reproached for their lack of patriotism which not only permits them to sell the foreign tires, but also to advertise them. Among the foreign tires that are found in many parts of Germany are the "Engelbert" tires, made in Belgium. Dealers are urged to be more patriotic and to refuse to sell any but German-made goods.

NOVELTIES IN RUBBER GOODS

The local fad for colored tire casings seems to be threatened by the luxury tax. It is an odd thing that while white, gray and black tires do not come under the class of goods subject to the luxury tax, the colored tires, which come in yellow, red, green and violet shades, and which are really no better in quality than their soberer compeers, should be considered luxuries. The coloring of tires is simply a mode of advertising as is the fashion of making marbleized or striped covers.

Are hard rubber high heels to take the place of those usually made of wood or leather? The *Gummi-Zeitung* thinks that this would be practicable; heels of this kind would have a more even, durable and handsome polish than the ordinary heels. They could be made with a soft rubber layer at the bottom. Hard rubber soles with inserts of soft rubber are also suggested.

NEW FIRMS

West-Deutsche Holsatia-Gummi-Gesellschaft m. b. H., Düsseldorf. This firm will have exclusive selling rights for the "Holsatia" rubber soles and heels manufactured by the Gummifabrik Friedrich Wilop, Hamburg.

A. Nitsche & Co., Leipzig; representation; sale of rubber goods.

Rheinische Gummimanufaktur, G. m. b. H., Mainz; manufacture and sale of rubber heels and soles of the trade-mark "Maxos." Capital, 200,000 marks.

Süddeutsche Gummiindustrie, Weissach-Württemberg, Karl Seutter, Weissach (Württemberg); wholesale dealers in tires and accessories for bicycles and automobiles, also rubber shoes and other rubber goods. The firm will also manufacture material for packing and leather floor cloth.

"Edigo" Gummiwaren-Vertrieb, Edgard Goldstein, Berlin; sale of rubber goods.

Gummigesellschaft Colonia, Bruno Aschenbach & Co., Köln-Kalk.

The Gummiwarenfabrik Hagufa, e. G. m. b. H., Harburg, has been changed to Gummiwarenfabrik Levante, G. m. b. H.

Gummiwarenfabrik "Imperator," Jander & Lemcke, Berlin-Tempelhof, has been dissolved and a new firm has been founded by Gustaf Lemcke, known as Gummiwarenfabrik Birkenwerder, Gustav Lemcke, located in Birkenwerder (Bez. Potsdam).

The Kölnische Gummifäden-Fabrik, formerly Ferd. Kohlstadt & Co., Köln-Deutz, reports net profits of 531,527.44 marks for the past year. A dividend of 14 per cent was declared. It was proposed to double the capital by issuing 1,500,000 marks' worth of original shares and 1,500,000 marks' worth of preferential shares.

RUSSIA

Owing to the chaotic condition of exchange it has been impossible to supply Russia's need for rubber. If credit and exchange could be arranged, Russia would probably take 10,000 to 15,000 tons of rubber immediately. The difficulties of the position are illustrated by the recent proposal that London firms should export to Russia 20,000,000 pounds of tea, for which payment of 25 per cent should be made in cash and for the remainder by twelve months' bills accepted by the Russian cooperative societies and endorsed by the Russian Foreign Trade Department.

FOREIGN TARIFFS

SWITZERLAND

The new provisional customs tariff of Switzerland, effective July 1, 1921, includes the following items of interest to the rubber industry.

Tariff No.	Articles	Rate of Duty: Former, Fr. cts. per 100	Rate of Duty: Revised, Fr. cts per Kilogs.
	G. INDIA RUBBER AND GUTTA PERCHA.		
	India rubber and gutta percha, pure or mixed:		
	Without internal layers of metals or tissues:		
516	In blocks, bulbs, and negroheads (raw rubber): "Patentplatten," not vulcanized; india rubber and gutta percha waste	1.00	2.00
517	In strips, sheets, plates, plugs, moulded articles, threads, balls, rods, etc	1.00	5.00
518	Hose, tubes, pipes	5.00	10.00
519	Threads for making elastic tissues	5.00	5.00
520	Carpets for rooms and passages, mats, etc	20.00	30.00
	With internal layers of metals or tissues:		
521	Plates, rings, balls, strips, bands, etc	5.00	10.00
522	Tubes and pipes	8.00	20.00
523	Transmission belts	20.00	40.00
524	Carpets for rooms and passages, mats, etc	20.00	40.00
525	Gummed tissues for industrial use, stuffs for cards, covers for printing cylinders, insulating materials	3.00	5.00
526	Rubbered stuffs (double stuffs) for cart tilts, etc	30.00	80.00
527	Elastic tissues of all kinds, of rubber combined with cotton, wool, silk, etc	40.00	80.00
528	Rubber and gutta percha, applied on tissues or other materials; waterproof fabrics for sanitary purposes, rubbered on one or both sides	30.00	80.00
529	Articles of rubber and gutta percha not elsewhere specified	25.00	60.00

MISCELLANEOUS FOREIGN NEWS

INCREASE OF MOTOR TIRES IN NEW ZEALAND

ACCORDING to *Commerce Reports* there has been a marked increase in New Zealand's imports of motor vehicles during the year 1920. A growing demand for trucks was noted while the large number of cars used will necessitate an increased supply of tires and spare parts. The gain in the items referred to is indicated below:

	1919	1920
Cars	£976,135	£2,435,303
Trucks	148,953	485,870
Tires	860,048	1,803,959
Spares	118,724	240,997
Total	2,103,860	4,966,129

THE TIRE INDUSTRY IN THE ORIENT

It is interesting to note that statistics show a steady and remarkable increase in the value of United States exports to the Orient during the years 1918-1920. These same statistics show also a decline during the first months of 1921, indicative of business conditions everywhere for that period. In the table following, one division only, the Dutch East Indies, shows an increase in the volume of exports for the first three months of 1921:

				1921		
Rubber Tires	1918	1919	1920	January	February	March
China	$71,558	$254,784	$421,364	$27,005	$13,939	.....
Japan	118,685	422,432	491,246	20,218	5,496	.....
India	294,619	557,396	1,096,377	60,554	51,713	$36,387
Philippines	982,224	1,372,544	2,431,252	130,551	99,313	35,282
Dutch East Indies.	$19,535	686,873	1,712,524	37,966	80,136	54,037

THE CHINESE RUBBER GOODS MARKET

There are no factories within the Shanghai consular district engaged in the manufacture of rubber goods of any kind. Less than 40 tons of india rubber and gutta-percha were imported into all China during the year 1919, which exceeds the imports for all previous years. This indicates little if any manufacturing of rubber goods throughout China. No scrap, waste or reclaimed rubber is imported into China, though small amounts of waste and old rubber are exported through the port of Shanghai.

Imports of india rubber and gutta percha and manufactured articles, including boots and shoes, for all China for the years 1913, 1918 and 1919 were:

Imported from—	1913	1918	1919
Canada	....	$2,725	$48,572
France	$22,129	11,365	23,375
Germany	19,868	....	....
Great Britain	43,160	25,821	46,038
Hongkong	18,152	27,031	43,328
Japan (including Formosa)	26,739	728,377	1,426,421
Philippine Islands	....	1,455	46,126
Russia and Siberia	165,328	12,978	25,901
Singapore, Straits Settlements, etc.	188	4,395	14,331
United States	12,143	128,746	468,227
All others	2,223	573	5,454
Gross imports	$309,930	$943,466	$2,147,773
Reexported to foreign countries	42,599	65,598	162,005
Net import	$267,331	$877,868	$1,985,768

There are approximately 3,500 passenger automobiles in Shanghai, from seventy to eighty per cent of which are four to five-passenger cars. About 75 per cent of the 150 motor trucks used in the Shanghai consular district are equipped with solid tires, though there is a decided tendency to replace these with the pneumatic truck tire.

Estimating conservatively there are 25,000 rickshaws in Shanghai alone, all of which use pneumatic tires, principally the double (outer and inner tube) tire, size 36 by 2 inches, or 900 by 50 centimeters (centimeter=0.393-inch). A very large proportion of these are Dunlop tires, manufactured in Japan, and sold at a price much less than American-made tires are being sold for in Shanghai. There are also in use in Shanghai about 2,000 carriages known as Victorias, all of which are supplied with rubber tires.

It is said that cord tires are more in demand than are the fabric types. All cords are straight-side, whereas the fabric type embraces both straight-side and clincher type. The standard metric and standard inch sizes are used here as in the United States. The greater proportion of tires used on automobiles in Shanghai are of American manufacture, the foreign firms competing being but two in number, one English and one French. Owing to unfavorable climatic conditions for the preservation of rubber goods, the system of consigned stocks of tires is impracticable.

The total value of the net imports of automobile tires for 1919 was over ten times as great as in 1913 and nearly fifty times as great as in 1918 in the Shanghai consular district. The reexports from Shanghai to other Chinese ports in 1918 decreased materially the net imports. This indicated the development of the tire market in this district. There are numerous service stations and garages in Shanghai where tire changes, adjustments, etc., are performed as skilfully as in the United States.

The market for rubber boots and shoes is limited, though in 1919 there were approximately 14 times as many imported as in 1918. Because foreign-made shoes find a very small market with the Chinese natives, their shoes being made by local shoemakers, foreign-made rubbers will not fit, and galoshes and rubber boots are not popular. An American importing firm in Foochow imported 4,000 pairs of rubber soles from a Chinese rubber firm in Singapore. These were sold immediately, as was a second large order, and the local native dealers impatiently awaited the arrival of a third shipment.

Factories are steadily increasing in China, which will in turn increase the market for belting, packing, hose, etc., which today have a fairly ready market.

Rubber clothing, while popular with the foreign population, is not used by the natives to any great extent. There would appear to be a much better market for rubberized fabric from which garments of Chinese patterns could be made.

The market for druggists' rubber sundries, such as rubber gloves, hot-water bottles, hard-rubber goods, etc., is excellent. Goods are distributed through agents and through the aid of catalogs, printed in English and Chinese, with illustrations. One firm stated that their business in such goods had doubled since May, 1920, and that it was difficult to get sufficient goods to supply the demand from the native population.

In general the basis of financial credits in the importation of rubber goods is the same as other imported commodities. Terms of payment are purely matters between the parties to the transaction and dependent upon circumstances. The import duty upon india rubber and india rubber goods is 5 per cent ad valorem, to which duty is added a fee of 5 per cent of the duty charges for wharfage and warehouse dues.

TIRE NOTES FROM INDIA

The roads of India may be put into three classes; first, the good metalled roads in and near towns; second, the main country roads made of white hard clay watered and rolled and topped with fine sand; and third, the cross-country roads which are merely cart tracks used by bullock carts, and with frequent ditches crossing them. The first and second classes are very good for tires, causing but little wear and tear, while the third class is used only in cases of dire necessity and at considerable risk. A new system of oiling roads has lately come in and this has led to the production of the oil-proof tire.

During the war, the American tires made great headway in India as in England, wide and judicious advertising having helped the business. American cars were also largely imported and this led to the Firestone, Fisk, Goodyear, Goodrich, and some other American tires getting well established. Since the cessation of hostilities, however, the British tire, especially the Dunlop, has been going ahead. Dunlop is selling millions of cycle tires, a new phase of Indian native life being the using of cycles on an extensive scale; and only the best soft rubber tires are in demand.

Another innovation is the use up-country for agricultural purposes of the light truck of 1 to 1½ tons capacity with solid tires. In Bombay the 5-ton truck is now competing successfully with

bullock carts in the transit of bales of cotton. A form of tire which is highly spoken of is the Pennsylvania, which is fitted with vacuum cups, the only drawback being its high price.

IMPORTS AND EXPORTS OF INDO-CHINA

A recent official report of the trade of Indo-China during 1919 shows that the imports of rubber goods in that year were valued at 10,545,000 francs, as compared with 3,076,000 francs the previous year. France supplied tires, tubes, etc., amounting to 1,512 quintals, valued at 5,744,800 francs, which shows an increase in value of 4,439,800 over the total for 1918, when the figures were 687 quintals, value 1,305,000 francs. At the same time Indo-China imported from France electric wires and cables to a total of 316 quintals, value 284,400 francs, as compared with 603 quintals, value 271,000 francs.

Among the rubber articles imported from other countries were: footwear—210 quintals, value 333,300 francs, in 1919, and 391 quintals, value 313,100 francs, in 1918; elastic fabrics—616 quintals, value 307,800 francs, in 1919, against 55 quintals, value 136,800 francs, in 1918; belting, hose and packing—332 quintals, value 596,900 francs, and 421 quintals, value 378,800 francs, in 1919 and 1918, respectively; tires and tubes—701 quintals, value 2,663,500 francs, in 1919, and 403 quintals, value 766,000 francs, in 1918. As will be noted, the greatest increase took place in tires, where the excess in value over that of the previous year was 1,897,500 francs.

The foreign countries participating in this trade in 1919 were: Singapore—which supplied rubber goods totaling 294 quintals, value 891,000 francs; England—116 quintals, value 266,000 francs; Japan—1,302 quintals, value 612,000 francs; United States—185 quintals, value 493,000 francs; Philippines—149 quintals, value 556,000 francs.

The exports during 1919 amounted to 29,505 quintals, value 23,604,000 francs, as compared with 5,377 quintals, value 3,226,000 francs, the year before. The entire rubber exports went to France in 1918. In 1919 the greater part, 27,844 quintals, value 22,275,000 francs, was taken by France, the remaining 1,661 quintals, value 1,329,000, going to other countries.

THE SOUTH AFRICAN RUBBER MANUFACTURING CO., LTD.

An interesting example of a plant representing some of the most modern practice in the rubber industry is that furnished by the South African Rubber Manufacturing Co., Limited, at Howick, near Johannesburg.

The business of today is the outgrowth of two smaller industries established several years ago, while in 1918 plans were being considered regarding a decided expansion. As a result the South African Rubber Manufacturing Co., Limited, became associated with George Spencer, Moulton & Co., Limited, and Wood-Milne, Limited. The capital was subscribed in South Africa and England, while practically all the machinery at the Howick plant came from the latter country.

The main building at Induna Mills, Howick, is divided into three sections, each 50 feet wide and 180 feet long, and each devoted to a particular branch of the rubber industry. In the first section, for instance, pneumatic tires and tubes are manufactured, while the other two divisions supply woven and braided hose, conveyor and transmission belting, brake and coach gear, footwear and general mechanical goods. The Induna Mills were built after a thorough inspection of English and American factories.

A SMALL VOLUME ENTITLED "RUBBER PLANTING, A BOOK FOR the Prospective Estate Assistant in British Malaya," endeavors to give an idea of the exact conditions of plantation life in Malaya. An entire chapter, for instance, is devoted to "Tropical Health Hints." Another entitled "Rubber Estate Work," appears to be very comprehensive, while the subject of rubber planting, in all its details, is thoroughly covered. This book was reviewed in THE INDIA RUBBER WORLD, December 1, 1920.

THE RUBBER TRADE IN THE FAR EAST

By Our Regular Correspondent

MALAYA

Now that the plan for compulsory restriction of the output of rubber has been squelched by the Colonial Secretary, new suggestions are cropping up and another few months will probably go by before anything definite has been decided upon. At an important meeting held at Kuala Lumpur on May 18, seven different schemes for getting the rubber industry out of its difficulties were received. One of these was being considered by the Rubber Growers' Association in London but so far no details are available for publication.

At the above-mentioned meeting, the opinion seemed to be that although all of the schemes had defects the Kellie-Smith plan and the Carey plan were the best. The first restricted the output 50 per cent by imposing a heavy export duty, not to exceed 10 per cent ad valorem or 5 cents a pound, on all excess over 50 per cent of the normal output.

The second plans a 25 per cent restriction, with the following objects: Reduction of rubber stocks, aid to weak producers, and proof to the Government of the industry's desire to assist itself. To this end it is proposed to place a tax of 1 to 2 cents a pound on all rubber exported, the money thus obtained to be utilized to capitalize a land bank through which weak producers offering good securities would be assisted.

Those who favor this plan point out that the Government might be more ready to favor a scheme of compulsory restriction if the industry itself were prepared to assist weak producers. It is believed that one of the chief obstacles to legislation is the inability of the Government to finance deserving claims, which legislation implies.

There are those who oppose this scheme on the ground that governmental assistance would again be required and that so far attempts to get governmental assistance in the matter has resulted in nothing but a waste of time.

Certainly, the Malayan rubber industry, which is hardest hit by prevailing conditions, has spent many months in profitless discussion. It was in September of 1920 that the stock position began to cause anxiety, and although almost a year has passed, nothing definite has been accomplished in remedying the situation.

If much more time is spent in futile talk, producers will some day awaken to the fact that the only plan that has been properly supported is the "shake out" which the schemes under consideration were intended to prevent!

And what will be the result of a shake-out? The Malayan rubber industry will pass from under British control, says *The Malayan Tin & Rubber Journal*:

> Men with long purses who have no sympathy for the Malayan industry and think only of what they can get out of it will buy up cheaply the more valuable of the weakly financed estates. They will be cunning enough to acquire control of the rubber planting industry to the detriment of everyone but themselves. It recalls how foreigners acquired large areas of British oil territory and that this combination was strong enough to gain the ear of the Colonial Office and a large influence in Parliament.
>
> In the case of Malaya it is probable that as the greater part of our rubber goes to a foreign country the control will be exercised in that country.
>
> Although owners may be ruined and estates abandoned, the trees will still continue to yield latex. They will of course be overtapped and the product will be bought largely by the huge combines, who being intimately concerned with the manufacturers, or maybe the manufacturers themselves, will see that the general user of rubber articles pays the full price for them. That will not benefit the producer—but the manufacturers. There can then be no revival of the rubber industry so far as Malayan planters are concerned.

SPREAD OF PINK DISEASE

Another worry that has been added to the burden of the Malayan rubber plant is a serious spread of pink disease north of Selangor and in lower Perak. Abandoned native holdings and poorly kept, overtapped areas are the chief centers of the disease.

This is particularly alarming at present because the disease is caused by a fungus by which neighboring estates could easily be infected, and further, although the Pests Enactment makes it punishable for estate owners or managers to fail to combat the disease, the enactment would be of little use now. Owners who had to abandon their estates and had no money to treat pink disease, would not be able to pay the fine for not doing this work. The Department of Agriculture is trying to locate all abandoned areas with a view of supervising them and dealing with any outbreak of pink disease.

SMALL HOLDINGS

For various reasons small holdings are attracting a good deal of attention and statistics regarding the acreage of holdings having an area of less than 100 acres should be interesting.

The following figures for 1919 were published in *The Agricultural Bulletin of the Federated Malay States:*

Holdings Less Than 100 Acres in Extent

	Acreage planted	Acreage in bearing	Number of trees tapped
Perak	182,117	101,773	15,266,015
Selangor	128,721	78,580	12,185,350
Negri Sembilan	73,901	30,331	4,549,650
Pahang	24,287	8,688	1,303,200
Totals	409,026	219,372	33,304,215

The number of trees, as a rule, has been calculated at the rate of 150 trees per acre.

CEYLON

At a recent meeting of the Ceylon Chamber of Commerce the following resolution was almost unanimously adopted:

That on sale of spot rubber, that is, rubber sold for delivery within one month, brokerage be 1 per cent.
On sale of rubber on forward contract, ½ per cent.
This item had been:
On sale of rubber on invoices up to and including 1,000 pounds, 1 per cent.
Invoices over 1,000 pounds, ½ per cent.

THE NETHERLANDS EAST INDIES

In February of this year a meeting was held, under leadership of the Director of Agriculture, with representatives of various banks and of tea and rubber interests, when a committee was formed to study the question of aiding estates. Through the efforts of this committee an Agricultural Loan Bank will be established which will aid worthy estates by loans, and if necessary, temporarily acquire and exploit estates.

Creditors of these estates will be required to postpone their claims until the bank loans have been paid. Furthermore, attempts of creditors to acquire plantations at prices below their actual value will be prevented by the bank through its right to acquire temporarily such property.

The Agricultural Loan Bank will be capitalized at 1,000,000 gilders (normally, $400,000); private parties have already largely promised cooperation, but the bank will rely chiefly on moral and material support of the Government which has guaranteed financial assistance to a certain maximum yet to be fixed and which also takes upon itself responsibility for any losses the bank may sustain.

JAVA RUBBER TRADE IN 1920

Reports concerning Java's trade in rubber and rubber goods show that the imports of bicycle tires in 1920 amounted to 643,505 pieces against 196,067 in 1919 and 265,960 in 1918. Automobile tires showed a smaller but steadier increase, the figures being: 104,616 in 1918, 200,906 in 1919 and 247,663 in 1920.

Exports of rubber during the year under review totaled 30,000 metric tons (2,204.6 pounds = 1 metric ton) as compared with 35,000 metric tons in 1919. Shipments to the United States, which went direct, showed a decrease, being 12,000 metric tons against 18,700 metric tons in 1919.

The lowest prices for standard crêpe and standard sheet obtained during December, 1920, when the rates per half-kilo fell below 50 and 40 cents. However, even at these low prices, most of the Java estates were able to sell their product without loss as the cost of production in Java is generally around 35 cents a pound.

SUMATRA ESTATES CLOSING DOWN

The situation in Sumatra and particularly on the East Coast is gradually getting worse. The Japanese estates appear to be the hardest hit, although the American concerns are also in difficulties. The number of plantations closing down is increasing. Many estates are stopping the separate administration of their various plantations and are uniting them as far as possible.

Of course, the rate of unemployment, both European and coolie, is growing as well as the number of estates that are cutting salaries. Thus far only one Dutch concern has lowered salaries, all the other firms being foreign.

RUBBER EXPORTS FROM SUMATRA

According to data furnished by the Commercial Association of Medan, exports of rubber from the East Coast of Sumatra during 1920, amounted to 32,695 tons, against 38,368 tons in 1919. The value of exports in 1919 was 88,692,620 gilders and in 1920. 57,522,425 gilders, which is a decrease of 35 per cent. Exports for the first quarter of 1921 totaled 6,428,149 kilos. On this basis, the entire exports for 1921 would amount to 25,712,592 kilos which, it is estimated, would be 10,000 tons less than the production for the year.

DISTRIBUTION OF RUBBER PLANTATIONS IN DELI

The Commercial Association of Medan gives the following interesting figures regarding the crops for 1920 and the areas planted and producing by December, 1920.

	Area Planted Hectares	Area Producing Hectares	Crop Kilos
Dutch	45,685	27,261	9,625,942
British	42,335	32,105	12,540,254
Dutch East Indian	10,556	6,080	2,029,363
American	25,356	17,731	6,321,880
Belgian-French	17,084	13,319	4,630,948
Japanese	3,410	1,110	381,231
German	1,726	1,658	859,078
Swiss	1,422	816	303,836
Shanghai	2,075	926	291,928
Totals	149,649	101,006	36,984,460

Below follows a comparison of the percentage of area in production and the annual yield per hectare.

	Percentage	Kilos Per Hectare
German	90.20	518
Belgian-French	77.96	348
British	75.84	391
American	69.93	357
Dutch	59.67	353
Dutch East Indian	57.60	333
Swiss	57.45	371
Shanghai	44.59	316
Japanese	32.55	343

A review of the various cultures shows that English capital is mainly invested in tea and rubber; French-Belgian capital, in rubber and palm oil; Dutch capital is prominent in all cultures; Dutch East Indian, in rubber and copra, while American and Japanese capital is invested only in rubber.

THE NETHERLANDS INDIES RUBBER FACTORY

The annual report of this company shows that the year 1920 was more favorable than previous years. A good deal of money was spent on new machinery and extensions in the buildings. In 1920, all of the new machinery ordered had not yet arrived and work had to continue with the old and small installation. In spite of this, output showed a 30 per cent increase over that of 1919.

The capital has been raised by 100,000 gilders to 550,000 gilders because of expansion of the factory buildings and the need for new machinery. In spite of the expenses incurred through experiments with solid tires amounting to 15,048.86 gilders, the accounts showed a favorable balance of 25,138,97½ gilders

JAVA RUBBER SALES ASSOCIATION

The rubber cultivating companies in the Netherlands East Indies, following the example of the Java Sales Association, are planning to pool the interests and stocks of the members, and control the sale of these stocks.

MOULD ON PLANTATION RUBBER

The subject of mouldy rubber has created a great deal of interest recently and there seems to be much mystery surrounding the subject. There can be no doubt that, to a great extent mould is due to the rubber being insufficiently dried in the factories. It was in their interests when prices were high to rush the rubber through in as short a time as possible, and get it on the market. Many Malayan estates, with greatly increasing crops, found their smokehouse accommodation quite insufficient and were forced to empty them too soon to make room for new rubber. Other estates had built their factory in the old part of the estate. As new and distant areas came into bearing the rubber had to be brought long distances and in some cases an anticoagulant was put in the latex to prevent it coagulating before it reached the factory. Rubber so treated takes much longer to dry and through carelessness or necessity it did not receive the extra time necessary in the smokehouse. It is believed that these two causes account for a great percentage of the mouldy rubber in New York and London.

There have been cases, however, where none of these causes would apply and mould still existed. One manager declares he had followed a shipment personally from the estate to Singapore. It left the estate in perfect condition and yet it was mouldy on arrival. He claims he found a remedy by placing an ordinary ebony ruler in the center of the case during packing and that the small air space left after its withdrawal prevented mould.

The chief chemist at Buitenzorg, Java, states that the undercuring of sheet was not responsible for mould; that the moisture content of the virgin was so small that it was quite impossible to determine its extent. After having spent a year investigating this subject they have concluded that mould is a germ that feeds upon the proteins which are on the surface of the rubber before going to the smoke-house, and the process of smoking does not destroy either the germ itself or the food value of the proteins; and up to the present time they have not been able to find any chemical preparation or germ-killing treatment which will destroy the germ, or the food properties on the surface of the rubber. Many estates in Java, after passing the sheet through the rollers, soak it in cold running water from 5 to 12 hours to wash as much as possible of the proteins from the surface of the rubber. Methylated spirit is also used for washing sheets before packing, purely as a mould preventive.

BRAZIL'S RUBBER TRADE DURING 1920

FIGURES for the general trade of Brazil during 1920 show an increase of 59.9 per cent in imports as compared with those for 1919, while exports declined 17.3 per cent as against those for the year before. While 1919, a record year all over the world, showed a balance of trade in favor of exports amounting to 39.8 per cent, 1920 showed an adverse balance of 13.7 per cent against exports. Exchange conditions have been responsible for this state of affairs and as they still show no improvement, the adverse balance of trade for the first four months of 1921 has increased considerably.

Among the articles to show decreases in exports was rubber. In 1919 shipments abroad totaled 33,252 tons, value 105,537 contos of reis; but in 1920 there were 23,531 tons, value 58,261 contos of reis, or a decrease of 29.2 per cent in quantity and 44.8 per cent in value. Rubber, which once ranked second only to coffee, has now fallen to twelfth place on the list of specified staples. It is the opinion that cost of production will have to be considerably reduced and the price will have to go up again to at least 3$000 per kilo before this trade will regain pre-war level.

The United States headed the list of countries dealing with Brazil, both as regards exports and imports of all merchandise in general, and of rubber in particular. It is interesting to note that Germany is rapidly forging ahead here and that she ranks third on the list of suppliers of imports. It is thought that if the mark continues low and Germany can secure the necessary tonnage, she will, before long, outstrip England and the United States. Meanwhile she is exporting quantities of goods regularly at prices that are termed ridiculously low.

Imports of rubber goods, including tires, show an increase of 1,363 tons or almost 100 per cent as compared with 1919, figures being 1,368 tons in 1919 and 2,731 tons in 1920. This great expansion was due to the extraordinary demand for tires for cars which have been imported in large numbers since the armistice and for which there has been an active demand.

Exports of crude rubber were distributed as follows:

From—	1919	1920	To—	1919	1920
Manáos .....*tons*	14,037	11,728	Germany .....*tons*	.....	639
Itacoatiara	112	114	Argentina	61	6
Pará	17,764	10,931	Belgium	22	138
Maranhão	42	10	United States	23,299	13.812
Ilha	96	184	France	2.556	1.475
Fortaleza	485	145	United Kingdom....	6,769	7,302
Pernambuco	.....	70	Italy	.....	2
Bahia	334	237	Holland	328	163
Rio	87	2	Portugal	32	11
Santos	.....	2	Sweden	15	40
Corumba	247	146	Uruguay	161	.....
Recife	48	.....	Denmark	7	.....
Natal	.....	19			
Totals .....*tons*	33,252	23,588	Totals .....*tons*	33,252	23,588

Figures for the years 1913 and 1917-1920 are as follows:

	1913	1917	1918	1919	1920
Total in tons.....	36,232	33,998	22,662	33,252	23,588
Value in contos.....	155,631	144,080	73,728	105,537	58,349
Value in £1,000....	10,375	7,484	3,998	6,240	3,716

NEW RUBBER FACTORY IN SAO PAULO

In addition to the Companhia Brasileira de Artefactos de Borracha (successors to the Industria Brasileira de Borracha Berrogain, Limitada), which has been manufacturing rubber products for some time and which soon will have a daily production of 250 tires, 250 inner tubes, and 50 solid tires, São Paulo is also to have another factory to help take advantage of Brazilian rubber and avoid the necessity of importing so much rubber goods. The new establishment is to be a stock company known as the Sociedade Anonyma Fabrica Nacional de Artefactos de Borracha and capitalized at 300,000 milreis. The first-named company is capitalized at 6,000,000 milreis.—*Commerce Reports.*

TOY BALLOONS POPULAR IN ARGENTINA

Although toy balloons are extremely popular with the children of Argentina, they are sold only by peddlers, no stores selling them. Two large department stores have made a practice of giving away toy balloons and together average 23,520 balloons monthly, while on holidays when larger balloons are offered, bearing the name of the store and the Spanish and Argentinean flags, together with other wording, more than a thousand balloons are disposed of. An exporting factory in France sends over the deflated balloons which are inflated locally. The two sizes commonly employed are 10 and 12 inches in diameter when the balloons are fully inflated.—*Commerce Reports.*

AMERICAN TIRE-REPAIR MATERIALS POPULAR IN HAVANA

The repair shops and vulcanizers of Havana, Cuba, obtain their tire-repair materials almost exclusively from the United States. Only minor repairs of tire casings are customarily made, while retreading is practiced very rarely. Tire tubes, however, are repaired whenever possible.

Recent Patents Relating to Rubber

THE UNITED STATES

ISSUED MAY 31, 1921

NO. 1,379,602 Stylographic pen. J. Abegg, West Hoboken, assignor to Gordon Pen Co., West New York—both in New Jersey.
1,379,603 Stylographic pen. J. Abegg, West Hoboken, assignor to Gordon Pen Co., West New Work—both in New Jersey.
1,379,660 Surgical rubber wound-dam. W. H. Taylor, Guelph, Ont., Can.
1,379,787 Garter. W. H. Smith, New Haven, Conn.
1,379,809 Transplit demountable tire rim. E. M. Foster, assignor to The Hydraulic Pressed Steel Co.—both of Cleveland, O.
1,379,856 Wheel-rim fastening device for use with pneumatic tires. F. E. Enter, Cuyahoga Falls, assignor of ½ to W. Martin, Cleveland—both in Ohio.
1,379,887 Pneumatic tire. H. S. Williams, assignor of ½ to O. Keller—both of San Antonio, Tex.
1,379,890 Fountain pen. P. E. Wirt, Bloomsburg, Pa.
1,379,915 Pneumatic tire. J. Guagliardo, Hammond, La.
1,379,929 Inner tube in sections with plurality of cores, and mold for making. T. B. McLeroth, London, England.
1,379,944 Toy with elastic operating strip. E. M. Story, Braintree, Mass.
1,379,958 Chair mat with track for chair. M. Blumenthal, Brooklyn, N. Y.
1,380,109 Fountain pen. C. A. Luck, assignor to The Conklin Pen Manufacturing Co.—both of Toledo, O. (Original patent No. 1,315,373, dated September 9, 1919. Divided.)
1,380,231 Fountain pen. K. Matsumoto and K. Takagi, Tokio, Japan.

ISSUED JUNE 7, 1921

1,380,496 Sectional resilient tire. M. E. Osborn and J. R. Wollam, Midland, Pa.
1,380,501 Cushion tire. R. Sera, Los Angeles, Calif.
1,380,509 Printing machine for fruit. A. S. Wysong, Los Angeles, Calif.
1,380,625 Tire protector. M. C. Altmayer, New York, N. Y.
1,380,838 Revoluble heel insert. J. G. Robertson, New York, N. Y.
1,380,960 Rubber thimble for crocheting. V. Hmenia, Klein, Mont.
1,381,043 Umbrella cover with triangular-shaped elastic gusset at inner end of placket. I. H. Weinberg and C. F. Bisbing, New York, N. Y.
1,381,067 Water pillow. I. Eguchi, Tokio, Japan.
1,381,071 Rubber cover, preferably ribbed, for bottles and other containers. C. Flannery, Hornell, N. Y. (See description elsewhere in this issue.)

REISSUES

15,121 Tire design. B. H. Pratt, Milwaukee, assignor to The Federal Rubber Co., Cudahy—both in Wis. Original No. 52,116, dated June 18, 1918, for 3½ years.

ISSUED JUNE 14, 1921

1,381,108 Truck tire. L. R. Davis, assignor to Revere Rubber Co., both of Providence, R. I. (Substitute for application Serial No. 381,633, filed May 15, 1920.)
1,381,123 Truss. E. G. Hutterer, Sanborn, Ia.
1,381,168 Demountable rim for vehicle wheels. E. O. Coats, Postoak, Me., assignor of ½ to G. L. Hall, Leeton, Mo.
1,381,173 Inlaid tread tire. J. H. Dwork, Newark, N. J.
1,381,175 Anti-explosive and non-inflammable fibrous rubber gasoline tank. H. C. Ericsson, U. S. Army.
1,381,332 Self-filling fountain pen. P. H. Qualmann, Milwaukee, Wis.
1,381,336 Sponge rubber truss. L. Rehthaler, assignor to Battle Creek Appliance Co., Limited—both of Battle Creek, Mich.
1,381,345 Protector for rubber tires, combining rubber blocks on a metallic rim. H. C. Sankey, St. Louis, Mo.
1,381,373 Ventilated waterproof seam. A. Waterman, assignor of ½ to D. Waterman—both of Chicago, Ill.
1,381,546 Filling-bottle for fountain pens. W. G. H. Dziambor, assignor to the Firm Simplo Fullfeder Gesellschaft Voss, Lausen & Dziambor Fabrik fur Fullfederhalter und Goldfedern—both of Hamburg, Germany.
1,381,571 Fountain pen. F. H. Lennards, Evanston, Ill.
1,381,602 Cushion tire. I. Trautman, New York, N. Y.
1,381,608 Battery jar. O. Wittmann, Lincoln, Neb.
1,381,627 Dust cover for tire valves. G. E. Garrett, Salt Lake City, Utah.
1,381,815 Armored puncture-proof tire. R. H. Fenley, Fort Worth, Tex.
1,381,829 Nostril-cleaning device. R. R. Hartman, Chicago, Ill.

THE DOMINION OF CANADA

GRANTED MAY 31, 1921

211,998 Garter. R. A. Manny and J. A. Rielly, coinventors, both of New York City, U. S. A.
212,140 Rubber sole with integrally formed hobs. J. H. Stedman, Braintree, Mass., U. S. A.

THE UNITED KINGDOM

PUBLISHED JUNE 1, 1921

161,401 Pneumatic tire. W. Hughes, Bro. Dawel, Watling street, Llanrwst, Denbighshire.
161,420 Detachable rim for tires. A. Menegotti and G. Mancini, Fano, Pesaro, Italy.
161,512 Inflatable swimming belt. G. Jordahn, Palm Beach, Fla., U. S. A.
161,622 Reinforced solid tire. P. Chick, Market Square, Highworth, Wiltshire.
161,635 Fountain pen. M. D. Davis, 6 Cardinal Mansions, Carlisle Place, Westminster.
161,662 Balata belt united to layer of rubber-coated, vulcanized fabric. J. Dawson, Boultham Works, Lincoln.
161,664 Cushion wheel. T. H. Rushton, 31 Southbrook Road, Lee, London.
161,818 Mangle roller covered with vulcanized rubber. A. R. Hunter, Potter Street Iron Works, Worksop, Nottinghamshire.
161,860 Cushion wheels. A. L. Runyan, 3619 Farnam street, Omaha, Neb., U. S. A.
161,875 Reinforced pneumatic tire. J. H. Beaumont, 29 Southampton Buildings, London; S. J. Flynn, Court street, Portsmouth, Va., U. S. A.
161,897 Inner tube with thick tread and rim portions and thin sidewalls. W. Drury, 10 Lena Gardens, Shepherds Bush Road, London.
161,908 Driving belt for dynamos, motorcycles, fans, etc., made of strips of leather, canvas, rubber, etc., riveted together. F. H. Baker, Queen's Hotel, Alderley Edge, Cheshire.
161,984 Breathing apparatus. R. von der Heide, 43 Wielandstrasse, Charlottenburg, Berlin. (Not yet accepted.)
161,985 Respirator. R. von der Heide, 43 Wielandstrasse, Charlottenburg, Berlin. (Not yet accepted.)
161,986 Respirator. R. von der Heide, 43 Wielandstrasse, Charlottenberg, Berlin. (Not yet accepted.)
161,996 Removable heel, with metal plate for attaching. W. J. Follows, Croft, near Leicester.
162,240 Hydrometer. J. H. Kessler, 415 North East avenue, Vineland, New Jersey, U. S. A.
162,409 Horseshoe for race horses, hunters, etc., having rubber section to contact with ground. J. Wood, 359 Blackburn Road, Bolton, Lancashire.
162,475 Pneumatic tire. W. J. Harper, Glenariff Warrer Drive New Brighton, Cheshire.
162,535 Syringes, douches, etc. E. F., C. L., and S. L. Ristine and C. Lyons, Commercial Bank Building, Lexington, and B. Clark, Bowling Green—both in Missouri, U. S. A.
162,558 Reservoir shaving-brush with flexible rubber diaphragm around brush head and rubber tube extension from reservoir into brush. W. N. Parker, 78 Church Road, Teddington, Middlesex.
162,565 Inflatable rubber toys. H. W. Franklin and J. G. Franklin & Sons, Limited, Birkbeck Works, Birkbeck Road, Dalston, London. (See The India Rubber World, April 1, 1921, page 504.)
162,570 Foot-arch support. W. M. Scholl, 211 West Schiller street, Chicago, Ill., U. S. A.
162,619 Rim for tire valves. A. Schrader's Son, Inc., 470 Vanderbilt avenue, Brooklyn, N. Y., assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, New Jersey—both in U. S. A. (Not yet accepted.)

PUBLISHED JUNE 29, 1921

162,805 Canvas and rubber ring for attaching pneumatic tires to rim. J. T. Pickering, 19 Fort street, New Brighton, Cheshire.
162,856 Detachable rim for tires. Rapid Rims, Limited, and A. Jordan, 7 Pall Mall, Westminster.
162,857 Nipple. F. R. Graham-Yooll, Dulham Towers, East Trinity Road, Leith, Scotland.
162,932 Tire protector with fastening wires encased in rubber. W. C. McGeorge, 401 Battery street, San Francisco, Calif., U. S. A.
162,942 Compressible bottle for filling fountain pens. W. G. H. Dziambor, 12 Bartlesstrasse, Hamburg, Germany.
162,974 Heel protector with inset rubber cushion. O. W. Peters, 1039 South Hope street, Los Angeles, Calif., U. S. A.

FRANCE

PATENTS ISSUED, WITH DATES OF ISSUE

504,682 (October 8, 1919.) Non-slipping device for pneumatic tires. S. T. Buchanan.
504,837 (October 13, 1919.) Improvements in elastic tires for vehicle wheels. Naamlooze Vennootschap Octrooi Maatschappij Holland tot Exploitatie van Uitvindingen.
504,863 (October 14, 1919.) Cover for pneumatic tires. H. Muller and E. Hofstetter.
504,981 (October 16, 1919.) Braces for pneumatic tires. T. H. Bell and J. G. Schoenlehu.
505,107 (September 5, 1918.) Tread for solid or hollow rubber tires for all kinds of vehicles. A. Voland.
505,195 (September 1, 1919.) Improvements in pneumatic tires. C. C. Marshall.
505,283 (October 22, 1919.) Electric tire. C. Duplouich.
505,307 (October 22, 1919.) Resilient wheel. D. D. Anastasin.
505,471 (October 27, 1919.) New protector for pneumatic tires. E. Albissier.
505,787 (November 6, 1919.) Improvements in elastic tires. D. Maggiora.
505,823 (November 7, 1919.) Improvements in pneumatic tires. W. H. Richards.
506,079 (November 14, 1919.) Demountable rim. The Goodyear Tire & Rubber Co.
506,174 (January 16, 1919.) Elastic tire for all kinds of vehicles. J. A. Allaire and E. F. Guibourgean.
506,193 (November 18, 1919.) Protector for the rubber of elastic tires. D. Maggiora.
506,203 (November 18, 1919.) Improvements in resilient wheels. A. L. Runyan.
506,204 (November 18, 1919.) Improvements in elastic tires. A. L. Runyan.
506,462 (November 21, 1919.) Improvements in vehicle wheels. The Dunlop Rubber Co., Ltd.

Chemical Patents will be found on pages 819-820. Machinery Patents on pages 827-828.

506,512 (November 24, 1919.) Improvements in automobile wheels. J. S. Andrade.
506,528 (November 25, 1919.) Improvements in resilient wheels. C. Spada.
506,533 (November 25, 1919.) Tires for vehicle wheels. J. Bodard, S. Isaacs and M. Rothschild.
506,939 (November 18, 1918.) Unburstable pneumatic tire. J. F. S. Lemele.
507,112 (December 5, 1919.) Resilient wheel. J. Crespo-Conejo.
508,114 (January 3, 1920.) Protector for air tubes of pneumatic tires. H. S. Blynt.
508,395 (January 13, 1920.) Improvements in tires. McEven Tire Ventilator Co., Inc.
508,398 (January 13, 1920.) Rubber tire. E. Pruvost.
508,516 (January 16, 1918.) Improvements in tires of wheels using solid elastic spring rolls. E. Brunswick.
508,527 (May 11, 1918.) Armored rubber cover for pneumatic tires for airplanes, automobiles, etc. J. M. Pousset.
508,592 (August 20, 1919.) Inner tube proof against blow-outs. H. Lambert.
508,772 (January 20, 1920.) Non-skid tread. Racine Auto Tire Co.
509,130 (January 26, 1920.) Cover for pneumatic tires. Société F. E. C. I. T.
509,228 (January 20, 1920.) Improvements in rubber tires and in method of attachment. E. B. Killen.
509,317 (January 31, 1920.) Protective cover for pneumatic tires. L. C. Cummings.
509,766 (February 10, 1920.) Elastic tire. J. Milhau.
509,827 (February 12, 1920.) Reinforced rubber cover for pneumatic tires. I. Ortiz-Escofet.
509,950 (February 13, 1920.) Improvements in pneumatic tires. C. A. Gras.
511,871 (June 7, 1919.) Improved cover for pneumatic tires. J. J. J. Carette.

GERMANY

PATENTS ISSUED, WITH DATES OF ISSUE

338,629 (February 25, 1915.) Inhaler. Friedrich Hanft, Frauentorgraben 67, Nürnberg.
338,685 (January 1, 1916.) Nipple for feeding bottle. Carl Erwin Martin, Oeserstr. 23, Leipzig Schleussig.
338,830 (September 29, 1920.) Injecting syringe. Otto Schmidt, Bahnhofstr. 4, Nordhausen.
338,976 (August 3, 1919.) Irrigator. Hans Josef Goebbel, Charlottenstrasse 9, Düsseldorf.
339,018 (August 5, 1919.) Cover for pneumatic tires. Willy Krus, Stöckerstr. 6, Köln-Mülheim.
339,196 (March 30, 1920.) Lamellated tire. Boris von Loutzkay, Viktoria-Luiseplatz, Berlin.

TRADE MARKS

THE UNITED STATES

TWO KINDS OF TRADE MARKS NOW BEING REGISTERED

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

GRANTED MAY 31, 1921, ACT OF FEBRUARY 20, 1905

NO. 143,368 BUFFALO BILL PATCH, VIOLET RAY SELF-VULCANIZING—patches for repairing inner tubes, hot-water bags, and rubber footwear. H. R. Hoffeld, Buffalo, N. Y.

143,446 LIBERTY—elastic webbings, ladies dress beltings, garters, hose supporters, and suspenders. The Russell Manufacturing Co., Middletown, Conn.
143,447 KANGAROO—elastic webbings, garters, hose supporters, and suspenders. The Russell Manufacturing Co., Middletown, Conn.
143,448 SANSER—Elastic webbings, ladies' dress belting, garters, suspenders and hose supporters. The Russell Manufacturing Co., Middletown, Conn.
143,449 AMERICAN BEAUTY—ladies' dress belting, elastic webbings, and suspenders. The Russell Manufacturing Co., Middletown, Conn.
143,450 Withdrawn.
143,451 BLUE RIBBON—elastic webbings and ladies' dress beltings. The Russell Manufacturing Co., Middletown, Conn.
143,452 CAPITOL—elastic webbings and ladies' dress beltings. The Russell Manufacturing Co., Middletown, Conn.
143,453 LAUREL—elastic webbings. The Russell Manufacturing Co., Middletown, Conn.
143,454 RUSCO PRODUCTS, THEY SPEAK FOR THEMSELVES—beltings, brake-linings, clutch facings, etc. The Russell Manufacturing Co., Middletown, Conn.
143,473 TIREX—insulation materials for covering wire. Simplex Wire & Cable Co., Boston, Mass.

ACT OF MARCH 19, 1920, SECTION 1 (b)

143,526 ROAD RACER—tires. United States Tire Co., New York, N. Y.

GRANTED JUNE 7, 1921, ACT OF FEBRUARY 20, 1905

143,562 SAVE A DOLLAR EVERYWOMAN—women's shoes of leather, rubber, fabric, and combinations. Brown Shoe Co., Inc., St. Louis, Mo.
143,563 BUCKHECHT—shoes, boots and slippers of leather, rubber, canvas, and combinations. Buckingham & Hecht, San Francisco, Calif.
143,587 PERICLES PRINCE OF TYRE—tires. The Dunlop Rubber Co., Limited, London, Eng.
143,596 ARCH BELT—men's, women's, and children's boots and shoes of leather, rubber, or fabric. The Emerson Shoe Co., Rockland, Mass.
143,623 GOODRICH—waterproof coats, jackets, boots, shoes and shoe-packs. The B. F. Goodrich Co., New York, N. Y.
143,624 THE TIRE NEWS—monthly periodical. The Goodyear Tire & Rubber Co., Akron, O.

ACT OF MARCH 19, 1920, SECTION 1 (b)

143,817 "LOCKTITE"—tobacco pouches. F. S. Mills Co., Inc., Gloversville, N. Y. (See THE INDIA RUBBER WORLD, July 1, 1921, page 756.)
143,822 NONLEEK DOUBLE-TEXTURE TOP FABRIC—rubberized cotton piece goods. O'Bannon Corporation, Boston, Mass.
143,838 'NEVER CREEP'—fabric and rubber tire patches. United States Tire Co., New York, N. Y.
143,839 SPECIAL—druggists' sundries. Whitall Tatum Co., New York, N. Y.

GRANTED JUNE 14, 1921, ACT OF MARCH 19, 1920, SECTION 1 (b)

143,874 HERRINGBONE—tires. G. & J. Tire Co., Indianapolis, Ind.

THE UNITED KINGDOM

PUBLISHED MAY 18, 1921

412,420 BELLEROID—ebonite compound for electrical insulation. Barrett & Ellers, Limited, 127 and 129 Wallis Road, Hackney Wick, London, E. 9.
B413,553 PUNCTURE PROOFED TUBE (in representation of a rolled-up inner tube—tires and tubes. Puncture-Proof Tubes, Limited, 8, 22, and 23 Avenue Chambers, Vernon Place, Southampton Row, London, W. C. 1. (See THE INDIA RUBBER WORLD, February 1, 1921, page 369.)

PUBLISHED MAY 25, 1921

413,185 SPORTSMAN—anti-mudsplash device, made chiefly of rubber, for attachment to vehicle wheels. H. F. Ingram, 70 Basinghall street, London, E. C. 2.
413,186 GENTLEMAN—anti-mudsplash device, made chiefly of rubber, for attachment to vehicle wheels. H. F. Ingram, 70 Basinghall street, London, E. C. 2.
413,168 A within outline of ace of spades—vulcanite combs and buttons. The American Hard Rubber Co. (Britain), Limited, 13A Fore street, London, E. C. 2.

PUBLISHED JUNE 1, 1921

412,416 ECONOMOS—velocipede and motor vehicle tires. The British Centrope Co., 75 Aldermanbury, London, E. C. 2.
413,165 A within outline of ace of spades—vulcanite instruments and apparatus for surgical or curative purposes. The American Hard Rubber Co. (Britain), Limited, 13A Fore street, London, E. C. 2.

PUBLISHED JUNE 8, 1921

400,914 THE PARTRIDGE and representation of a partridge standing within a tire—all goods included in Class No. 40. The F. E. Partridge Rubber Co., Limited, 1 Metcalfe street, Guelph, Ontario, Can. Address for service in the United Kingdom, care of Abel & Imray, 30 Southampton Buildings, London, W. C. 2.
405,659 TIROMETER—combined valve and gage for inner tube. Tirometer Valve Corporation of America, 912 Kanawha Banking & Trust Building, Charleston, W. Va., U. S. A. Address for service in United Kingdom, care of Albert L. Mond, 19 Southampton Buildings, Chancery Lane, London, W. C. 2. (See THE INDIA RUBBER WORLD, April 1, 1920, page 434; March 1, 1921, page 437; April 1, 1921, page 517.)
407,081 Geometric design in black and white, with thistle represented in white silhouette in center—waterproof garments. Campbell, Achnach & Co., Limited, 59 Wallace street, Glasgow.
407,082 Geometric design in black and white, with thistle represented in white silhouette in center—goods manufactured from rubber and gutta percha not included in classes other than No. 40. Campbell, Achnach & Co., Limited, 59 Wallace street, Glasgow.
408,585 FRUITS & FLOWERS—chewing gum. Adams & Beemans, Limited, 89 Great Eastern street, London, E. C. 2.
410,923 WOOD'S "EVERLOC" TIRE PATCH—tire repair patches and repairing material included in Class No. 10. Winfield Copleywood, 74 Western avenue, Minneapolis, Minn., U. S. A. Address for service in the United Kingdom, care of Kilburn & Strode, Chancery Lane Station Chambers, 31 High Holborn, London, W. C. 1.

PUBLISHED JUNE 15, 1921

B405,213 NORTH POLE—tires and tirings in lengths. The Leicester Rubber Co., Limited, Granby Rubber Works, Post Office Place, Leicester.
407,256 HOOD and an arrow pointing to the right—footwear. Hood Rubber Co., Watertown, Mass., U. S. A. Address for service in the United Kingdom, care of Albert L. Mond, 19 Southampton Buildings, Chancery Lane, London, W. C. 2.
407,257 HOOD and an arrow pointing to the right—tires. Hood Rubber Co., Watertown, Mass., U. S. A. Address for service in the United Kingdom, care of Albert L. Mond, 19 Southampton Buildings, Chancery Lane, London, W. C. 2.
414,221 CLIMPETS—rubber boot and shoe protectors. Thomas Richard Lulham, 112 Becker street, Bellevue East, Johannesburg, South Africa. Address for service in the United Kingdom, care of Abel & Imray, 30 Southampton Buildings, London, W. C. 2.

PUBLISHED JUNE 22, 1921

411,037 NA within a diamond—crude or partly prepared rubber for use in manufactures. Naoyah Akuzawa, trading as The Sango Koshi, 5-5 Beach Road, Singapore, Straits Settlements. Address for service in the United Kingdom, care of Abel & Imray, 30 Southampton Buildings, London, W. C. 2.

PUBLISHED JUNE 29, 1921

411,024 ERRO-NO—cupyholders for typewriters, etc. Error-No Incorporated, 522 Ellwanger & Barry Building, 39 State street, Rochester, New York, U. S. A. Address for service in United Kingdom, care of Boult, Wade & Tennant, 112 Hatton Garden, London, E. C. 1.

411,055 ETCO—rubber goods excepting tires and tire accessories, included in Class No. 40. George Allen Stetson, trading as The Elastic Tip Co., 370 Atlantic avenue, Boston, Mass., U. S. A.

NEW ZEALAND

PUBLISHED MAY 19, 1921

16,860 Representation of a label bearing the words BARNET GLASS MILES CHEAPER & AUSTRALIAN TYRES—manufactured goods of rubber and gutta percha not included in classes other than No. 40. Wording may be varied by substitution of words indicative of goods other than tires. Barnet Glass Rubber Co., Limited, 289 Swanston street, Melbourne, Victoria, Australia.

17,906 Representation of seal bearing active and inactive volcano and the words NOBEL INDUSTRIES LIMITED, TRADE MARK—manufactured goods of rubber and gutta percha not included in classes other than No. 40. Nobel Industries, Limited, 220 Winchester House, Old Broad street, London, E. C., Eng.

DESIGNS

THE UNITED STATES

NO. 57,209 Tire. Patented March 8, 1921. Term 14 years. W. Carnal, Akron, assignor to The Knox Tire & Rubber Co., Mount Vernon—both in Ohio.

57,400 Tire. Patented March 15, 1921. Term 7 years. E. R. Throsby, assignor to Kelley Tire & Rubber Co.—both of New Haven, Conn. (Shown in THE INDIA RUBBER WORLD, May 1, 1921.)

57,461 Tire casing. Patented April 5, 1921. Term 14 years. F. H. Brewster, assignor to Madison Tire & Rubber Co., Inc.—both of Buffalo, N. Y.

57,571 Tire. Patented April 26, 1921. Term 14 years. A. Balthazar, Chicopee Falls, and M. R. Shaw, Springfield, assignors to The Fisk Rubber Co., Chicopee Falls—both in Mass.

57,631 Non-skid tread. Patented April 26, 1921. Term 14 years. E. O. Fritch, Belmont, assignor to Hood Rubber Co., Watertown—both in Mass.

57,709 Tire. Patented April 26, 1921. Term 3½ years. E. H. Nahm, assignor to The Ideal Tire & Rubber Co.—both of Cleveland, O.

57,758 Tire. Patented April 26, 1921. Term 7 years. E. Yockey, Milwaukee, Wis.

57,759 Tire. Patented May 3, 1921. Term 14 years. W. E. Armacost, assignor to The Columbus Tire & Rubber Co.—both of Columbus, O.

57,764 Tire. Patented May 3, 1921. Term 7 years. E. O. Blekre, Minneapolis, Minn.

57,765 Tire. Patented May 3, 1921. Term 7 years. E. O. Blekre, Minneapolis, Minn.

57,766 Tire. Patented May 3, 1921. Term 7 years. E. O. Blekre, Minneapolis, Minn.

57,767 Tire. Patented May 3, 1921. Term 7 years. E. O. Blekre, Minneapolis, Minn.

57,776 Disk wheel for pneumatic tires. Patented May 3, 1921. Term 14 years. L. B. Harvey, Stockton, Calif., assignor to Harvey Rim & Wheel Co., Inc., Buffalo, N. Y.

57,781 Tire tread. Patented May 3, 1921. Term 14 years. N. H. Losey, Akron, O.

57,790 Tire. Patented May 3, 1921. Term 14 years. F. H. Smith, Bloomfield, N. J.

57,791 Automobile step-plate. Patented May 3, 1921. Term 14 years. F. H. Stanwood, assignor to Stanwood Equipment Co.—both of Chicago, Ill.

57,792 Automobile step-plate. Patented May 3, 1921. Term 14 years. F. H. Stanwood, assignor to Stanwood Equipment Co.—both of Chicago, Ill.

57,813 Tire cover. Patented May 10, 1921. Term 14 years. W. A. Black, Perry, Ia.

57,830 Tire tread. Patented May 10, 1921. Term 3½ years. G. E. Foresman, La Fayette, Ind.

57,835 Tire tread. Patented May 10, 1921. Term 14 years. W. J. Greene, assignor to The Dixie Rubber Co.—both of Memphis, Tenn.

57,836 Tire tread. Patented May 10, 1921. Term 14 years. G. Grow, Boston, Mass.

57,842 Tire tread. Patented May 10, 1921. Term 7 years. C. A. Kline, San Francisco, Calif.

57,849 Tire. Patented May 10, 1921. Term 14 years. C. W. McKone, assignor to The Tuscan Tire & Rubber Co.—both of Carrollton, O.

57,856 Tire. Patented May 10, 1921. Term 14 years. J. Olson, Delavan, Ill.

57,861 Disk wheel for pneumatic tires. Patented May 10, 1921. Term 14 years. A. L. Putnam, assignor by mesne assignments to Detroit Pressed Steel Co., a Delaware corporation—both of Detroit, Mich. (See THE INDIA RUBBER WORLD, January 1, 1920, page 225.)

57,870 Tire. Patented May 10, 1921. Term 14 years. R. J. Stokes, assignor to Thermoid Rubber Co.—both of Trenton, N. J.

57,872 Tire. Patented May 10, 1921. Term 14 years. M. Switzer, assignor to Kelly-Springfield Tire Co.—both of New York, N. Y.

57,873 Tire tread. Patented May 10, 1921. Term 14 years. J. D. Tew, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

57,874 Rubber heel. Patented May 10, 1921. Term 7 years. T. Trimboli, Uhrichsville, O.

57,878 Tire. Patented May 10, 1921. Term 14 years. R. H. Waters, Akron, O., assignor to Kelly-Springfield Tire Co., New York, N. Y.

57,879 Tire. Patented May 10, 1921. Term 14 years. O. H. Williams, Columbus, O.

57,880 Tire. Patented May 10, 1921. Term 7 years. J. G. Wolfe, Chicago, Ill.

57,881 Tire. Patented May 17, 1921. Term 7 years. O. Basten, assignor to Sterling Tire Corporation—both of Rutherford, N. J.

57,886 Tire tread. Patented May 17, 1921. Term 14 years. A. L. Breitenstein, Akron, assignor to Hannibal Rubber Co., Hannibal—both in Ohio.

57,887 Tire tread. Patented May 17, 1921. Term 14 years. A. L. Breitenstein, Akron, assignor to Hannibal Rubber Co., Hannibal—both in Ohio.

57,888 Tire. Patented May 17, 1921. Term 3½ years. R. Butler, Barberton, O.

57,889 Tire. Patented May 17, 1921. Term 3½ years. R. Butler, Barberton, O.

57,894 Rubber-tired toy vehicle. Patented May 17, 1921. Term 7 years. G. Eklund, Winona, Minn.

57,898 Non-skid plate for automobile tires. Patented May 17, 1921. Term 7 years. C. B. Gibson, Chicago, Ill.

57,899 Tire tread. Patented May 17, 1921. Term 14 years. J. Graham, Detroit, Mich.

57,921 Disk wheel for use with pneumatic tires. Patented May 17, 1921. Term 14 years. V. Lougheed, Santa Barbara, assignor to Duodisk Steel Wheel Corporation, Los Angeles—both in Calif.

57,926 Tire casing. Patented May 17, 1921. Term 3½ years. G. W. Odell, assignor to International India Rubber Corporation—both of South Bend, Ind.

57,937 Tire. Patented May 17, 1921. Term 14 years. F. H. Smith, Bloomfield, N. J.

57,948 Tire. Patented May 17, 1921. Term 14 years. M. Switzer, assignor to Kelly-Springfield Tire Co.—both of New York, N. Y.

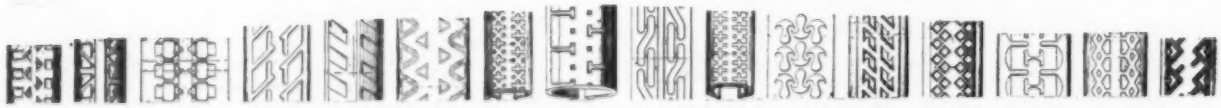
57,953 Tire. Patented May 17, 1921. Term 14 years. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

57,966 Wheel for use with pneumatic tires. Patented May 24, 1921. Term 14 years. G. H. Forsyth, Chicago, Ill.

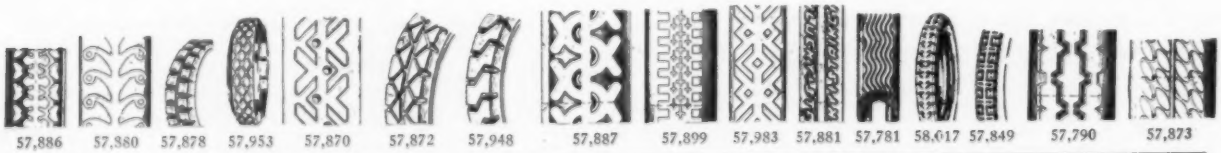
57,967 Disk wheel for use with pneumatic tires. Patented May 24, 1921. Term 14 years. G. H. Forsyth, Chicago, Ill.

57,973 Disk wheel for use with pneumatic tires. Patented May 24, 1921. Term 14 years. L. B. Harvey, Stockton, Calif., assignor to Harvey Rim and Wheel Co., Inc., Buffalo, N. Y.

57,631 57,709 57,461 57,758 58,058 57,764 57,937 57,842 57,765 58,018 57,830 58,080



58,081 57,836 57,879 57,889 58,113 57,759 57,766 57,209 57,571 57,767 57,856 58,022 57,835 57,888 57,926 58,067



57,886 57,880 57,878 57,953 57,870 57,872 57,948 57,887 57,899 57,983 57,881 57,781 58,017 57,849 57,790 57,873

57,983 Tire. Patented May 24, 1921. Term 14 years. W. M. Mackintosh, Springfield Township, Summit County, O.
57,989 Wall tumbler-holder with rubber-covered ring. Patented May 24, 1921. Term 14 years. C. A. Mosgrove, Watertown, Conn., assignor to The Autoyre Co., a Connecticut corporation.
58,017 Tire. Patented May 31, 1921. Term 7 years. W. A. Brubaker, Akron, O., assignor to Nu-Cord Rubber Co., Greensburg, Pa.
58,018 Tire. Patented May 31, 1921. Term 14 years. E. L. Campbell, assignor to The J. R. Watkins Co.—both of Winona, Minn.
58,022 Tire. Patented May 31, 1921. Term 14 years. D. A. Doyle, Jr., Akron, O.
58,058 Tire. Patented June 7, 1921. Term 7 years. E. O. Blekre, Minneapolis, Minn.
58,067 Tire. Patented June 7, 1921. Term 14 years. A. K. Brill, Muskegon, Mich., assignor to The Brunswick-Balke-Collender Co., Chicago, Ill.
58,070 Automobile disk wheel for pneumatic tires. Patented June 7, 1921. Term 14 years. F. S. Carver, East Orange, N. J.
58,080 Non-skid tread. Patented June 7, 1921. Term 14 years. A. A. Glidden, assignor to Hood Rubber Co., both of Watertown, Mass.
58,081 Tire tread. Patented June 7, 1921. Term 14 years. A. A. Glidden and G. G. Buell, Watertown, and E. O. Fritch, Belmont, assignors to Hood Rubber Co., Watertown—both in Mass.
58,109 Toy balloon. Patented June 7, 1921. Term, 14 years. E. T. Richert, Canton, O.
58,113 Tire tread. Patented June 7, 1921. Term 3½ years. J. E. Schneider, assignor to Beach-Wagstaff Rubber Corporation—both of Dallas, Tex.
58,164 Steel wheel for pneumatic tires. Patented June 14, 1921. Term 14 years. A. M. Stanley, Lynn, assignor to Stanley Steel Welded Wheel Corporation, Boston—both in Mass.

GERMANY

DESIGN PATENTS WITH DATES OF ISSUE

774,912 (January 13, 1921.) Hose coupling Pressluft-Industrie, Max L. Froning, Dortmund-Körne.
774,929 (March 5, 1921.) Rubber sole. Hannoversche Gummi-Regenerierwerke Luttermann & Co., G. m. b. H., Wunstorf.
774,930 (March 5, 1921.) Rubber sole, heel lift. Hannoversche Gummi-Regenerierwerke Luttermann & Co., G. m. b. H., Wunstorf.
775,093 (March 19, 1921.) Rubber sole. Balata-Werke Ferdinand Stein, Hannover-Wülfel.
775,094 (March 19, 1921.) Rubber sole. Balata-Werke Ferdinand Stein, Hannover-Wülfel.
775,253 (March 12, 1921.) Rubber tire. Gummi-Klötzer G. m. b. H., Dresden.
775,399 (March 31, 1921.) Rubber heel. Julius Schmitt, Grossenbaum.
775,485 (March 31, 1921.) Welding tube of rubber with inserts of fabric and covering of asbestos fabric. Paul Kölbel & Co., Hannover.
775,548 (March 31, 1921.) Corn plaster. "Vulnoplast" Fabrik Bonner Kautschukpflaster und chemisch-pharmazentischer Präparate, Bonn a. Rh.
775,575 (April 4, 1921.) Exchangeable rubber lift for shoe heels. Johannes Wulff, Grenadurstrasse 21, Schwerin i. M.
775,809 (July 14, 1920). Rupture band. Heinrich Fries and Adolf Traut, Cecilienkloster 5, Cologne on Rhine.
776,079 (March 12, 1921.) Rubber sole. Balata-Werke Ferdinand Stein, Hannover-Wülfel.
776,149 (March 10, 1921.) Rubber plate for the making of rubber soles. Chem. Fabrik Kossack, Düsseldorf.
776,229 (March 7, 1921.) Self-acting irrigator. W. Schleenbecker, Giessen.
776,295 (February 14, 1921.) Rubber sole. Jakob Kraft and Albert Kögl, Werderstrasse 25, Augsburg.
776,301 (March 3, 1921.) Rubber sucker with container and step motion. August Hohenstein, Ludwigsstrasse 35, Ludwigshafen on Rhine.
776,345 (April 7, 1921.) Revoluble rubber heel. Carl Schürer, Riebeckstrasse 24, Leipzig-Reudnitz.
776,349 (April 8, 1921.) Rubber calks for shoe soles. Carl Fr. Lommel, Bad Hornburg.
776,507 (March 31, 1920.) Tire of rubber substitute. Johannes Barth, Schmannewitz.
776,520 (March 2, 1921.) Rubber heel pad for orthopedic shoes. Westdeutsche Gummi-Compagnie H. Chormann, Düsseldorf.
776,813 (April 13, 1921.) Hæmorrhoidal pessary. Paul Henning, Kaiserin-Augusta Allee 77, Charlottenburg.
777,077 (November 29, 1920). Tire protector of leather with rubber tread. Caspar Schmitz, Neue Winterfeldstrasse 2-3, Berlin.
777,128 (April 12, 1921.) Rubber mat for running-board of automobiles. Lorge & Sabeck G. m. b. H., Berlin.
777,916 (February 26, 1921) Rubber sole for footwear. "Profitens" Gummiwaren-Gesellschaft m. b. H., Dortmund.
777,917 (February 26, 1921) Stretchable rubber sole, with protuberances. "Profitens" Gummiwaren-Gesellschaft m. b. H., Dortmund.
778,104 (April 11, 1921) Hose coupling. Pressluft-Industrie, Max L. Froning, Dortmund-Körne.
778,129 (April 25, 1921) Insulation for heat and cold protector. Philipp Gelius, Albanistrasse 2, Munich.
778,575 (April 25, 1921) Connection for belting. Waldemar Wagner, Scheveningen a. N.
778,590 (April 28, 1921) Haemorrheidal pessary. Hugo Gohmann, Sedanstrasse 27, Dortmund.
778,740 (May 2, 1921) Veil-like covering of rubber to protect ladies' hats from rain. Paul Hesse, Busingstrasse 12, Berlin-Friedenau.
778,818 (March 21, 1921) Connection for all kinds of belting. Anton Dubbelmann, Röckumstrasse 46a, Bonn E.
779,119 (December 17, 1920) Protector for pneumatic pressure tire. Eduard Fremm, Neufreistett i. B.
779,152 (April 22, 1921) Non-skid tread for pneumatic tires. Karl Pistor, Königstrasse 412, Elberfeld.
779,281 (March 29, 1921) Armored non-skid tire for bicycles. Willy Bronski, Wiesenstrasse 33, Hamborn.
779,553 (May 2, 1921) Overlay of rubber or similar material for shoe heels. Wilhelm Kaufmann, Eupen; represented by A. Kuhn, Berlin S. W. 61.
779,714 (May 6, 1921) Rubber sole with central groove. Hessische Gummiwaren-fabrik Fritz Peter, Klein-Auheim-on-the-Main.
779,725 (May 9, 1921) Shock absorber for the revolving rubber plate on heels of boots. Carl Kienle, Hauptstrasse 21, Stuttgart-Gaisburg.
780,149 (January 20, 1921) Rubber heel. H. C. Meyer, Jr., Harburg-Elbe.
780,156 (March 21, 1921) Rubber heel patch. "Profitens" Gummiwaren-Gesellschaft, m. b. H., Dortmund.
780,186 (May 2, 1921) Sole of rubber or similar material. Wilhelm Kaufmann, Eupen; represented by A. Kuhn, Berlin S. W. 61.
780,216 (May 12, 1921) Self-attachable rubber heel. Conrad Kiersch, Wisinar i. M.
780,219 (May 13, 1921) Rubber sole. Continentale Isola-Werke A-G., Birkesdorf b. Düren.

CASTING FOR TOY BALLOONS

By Felix J. Koch

Pure gum gas balloons, ordinarily called toy balloons, have as a rule been a sort of kindergarten proposition. To be sure, those who study upper air currents for weather reports use them from time to time in carrying instruments to high altitudes for obtaining meteorological data. Then, too, Europeans went very largely into advertising balloons, making many thousands of types that without doubt served an excellent purpose. Occasionally, also, they were used for decorations at banquets in the pre-Volstead days. Today, however, the balloon the world over is bought chiefly by indulgent parents or nurses to keep the little folks quiet. That the balloon should do something for the elders in the way of sport was not imagined until a sportive crowd in Cincinnati evolved the idea of fishing for them. The procedure is as follows:

The balloons, anchored out in mid-stream or far enough away from the shore to make a cast difficult, are placed at spaced intervals. The fisher, with casting rod and whatever type of hook he selects, stands on the shore and casts. The game, of course, is to get the balloon ashore without bursting it. The country clubs that have ponds, and fishing and game associations throughout the Middle West, have taken to the sport

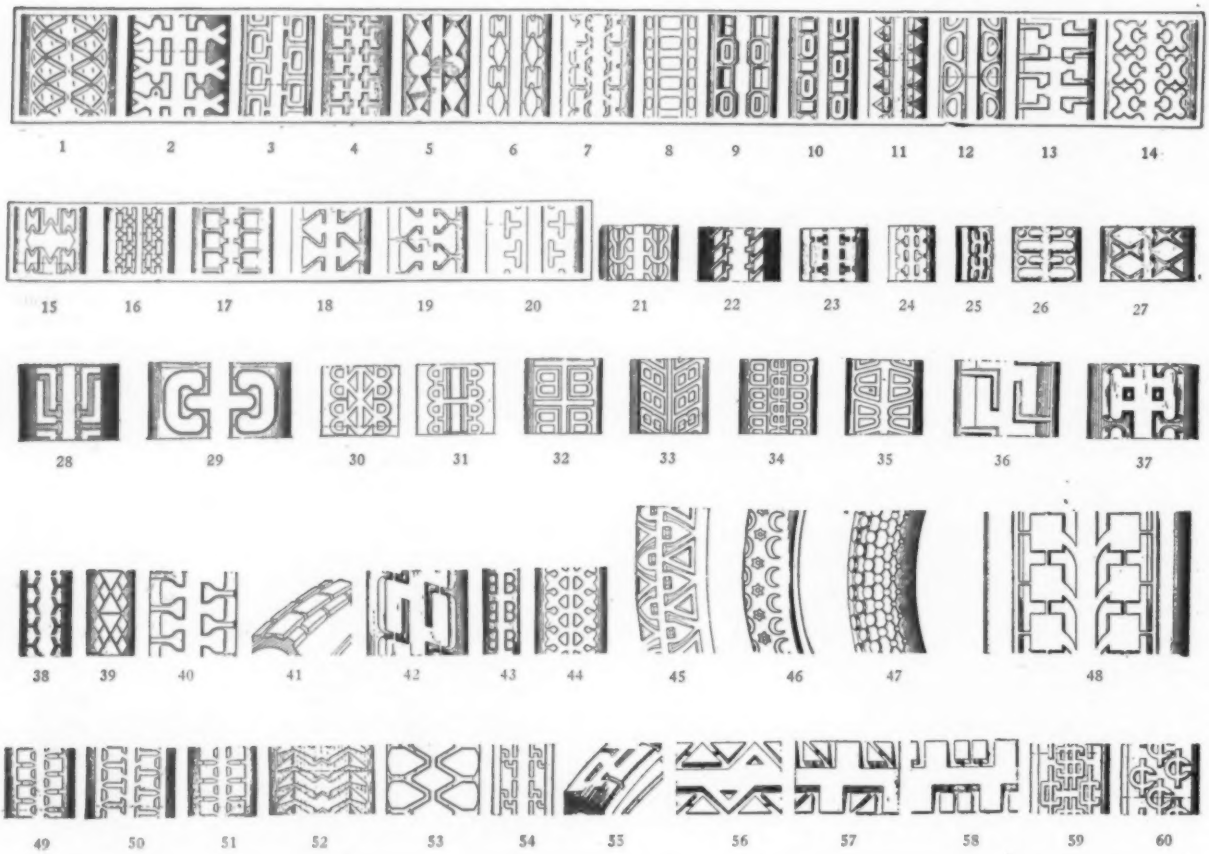
BAIT CASTERS READY FOR THE CONTEST

most enthusiastically. Moreover, the practice thus afforded teaches casting, both bait and fly, better than almost any other way.

Of course there are many ways of varying the contests. The balloons may be anchored so that they will remain in designated places, or they may be weighted so that they just rest on the surface of the water and are blown in various directions by the breezes or carried by the current. With one hundred balloons on the shore of a lake, with the contestants drawing lots for position, and with valuable prizes, a game that is bound to be a popular holiday diversion has at last been evolved for the rubber toy balloon.

Pneumatic Tire Tread Designs

September, 1920, to November, 1920, and January, 1921, to March, 1921



Cut	Patent	Patentee or Assignee and Address
(1)	55,585	G. E. Batcheller, Forest Hills, New York.
(2)	55,586	R. D. Belden, Marion, Ohio.
(3)	55,588	W. O. Bruess, Port Clinton, Ohio.
(4)	55,600	T. Follen, La Fayette, Indiana.
(5)	55,606	The Bowling Green Rubber Co., Toledo, Ohio.
(6)	55,611	Henderson Tire & Rubber Corp., Columbus, Ohio.
(7)	55,612	Henderson Tire & Rubber Corp., Columbus, Ohio.
(8)	55,630	R. P. McElrath, Lakewood, Ohio.
(9)	55,728	W. C. Owen, Cleveland, Ohio.
(10)	55,729	W. C. Owen, Cleveland, Ohio.
(11)	55,808	Armorcord Rubber Co., Morgantown, West Virginia.
(12)	55,813	W. C. Owen, Cleveland, Ohio.
(13)	55,832	Biltwell Tire & Rubber Co., Barberton, Ohio.
(14)	55,842	Wilson Rubber Co., Des Moines, Iowa.
(15)	55,966	The B. F. Goodrich Co., New York City.
(16)	55,987	W. E. Duersten, New Castle, Pennsylvania.
(17)	56,046	The Wildman Rubber Co., Detroit, Michigan.
(18)	56,103	U. S. Compression Inner Tube Co., Tulsa, Oklahoma.
(19)	56,104	U. S. Compression Inner Tube Co., Tulsa, Oklahoma.
(20)	56,105	U. S. Compression Inner Tube Co., Tulsa, Oklahoma.
(21)	56,271	E. O. Blekre, Sioux City, Iowa.
(22)	56,113	W. H. Milliken, Cleveland, Ohio.
(23)	56,158	The Charles William Stores, Inc., Brooklyn, New York.
(24)	56,243	H. H. Swan, Grand Rapids, Michigan.
(25)	56,282	The General Tire & Rubber Co., Akron, Ohio.
(26)	56,307	The B. F. Goodrich Co., New York City.
(27)	56,300	The McLean Tire & Rubber Co., Cleveland, Ohio.
(28)	56,122	The Charles William Stores, Inc., Brooklyn, New York.
(29)	56,217	Chillicothe Tire & Rubber Co., Chillicothe, Ohio.
(30)	56,265	E. O. Blekre, Sioux City, Iowa.
(31)	56,266	E. O. Blekre, Sioux City, Iowa.
(32)	56,267	E. O. Blekre, Sioux City, Iowa.
(33)	56,268	E. O. Blekre, Sioux City, Iowa.
(34)	56,269	E. O. Blekre, Sioux City, Iowa.
(35)	56,270	E. O. Blekre, Sioux City, Iowa.
(36)	56,260	J. M. Alderfer, Akron, Ohio.
(37)	56,299	The McLean Tire & Rubber Co., Cleveland, Ohio.
(38)	56,490	Lincoln Highway Tire Co., Fulton, Illinois.
(39)	56,616	E. C. Hufford and W. S. Bates, Watts, California.
(40)	56,620	The Cascade Tire & Rubber Co., Ravenna, Ohio.
(41)	56,623	The Dunlop Rubber Co., Limited, London, England.
(42)	56,619	The Amazon Rubber Co., Akron, Ohio.
(43)	56,688	W. P. Braender, Fassaic, New Jersey.
(44)	56,691	The Ideal Tire & Rubber Co., Cleveland, Ohio.
(45)	56,750	The Gordon Tire & Rubber Co., Canton, Ohio.
(46)	56,723	A. Heskett, Oakland, California.
(47)	56,766	H. S. Rector, Chicago, Illinois.
(48)	56,734	E. O. Blekre, Sioux City, Iowa.
(49)	56,908	E. O. Blekre, Sioux City, Iowa.
(50)	56,909	E. O. Blekre, Sioux City, Iowa.
(51)	56,910	E. O. Blekre, Sioux City, Iowa.
(52)	56,911	D. F. Crow, Omaha, Nebraska.
(53)	56,918	R. B. Gillette and R. W. Hutchins, Eau Claire, Wisconsin.
(54)	56,921	Syracuse Rubber Co., Inc., Syracuse, New York.
(55)	56,934	D. W. Whipple, New York City.
(56)	56,974	H. L. Kenyon, Setauket, New York.
(57)	56,975	H. L. Kenyon, Setauket, New York.
(58)	56,976	H. L. Kenyon, Setauket, New York.
(59)	56,980	E. L. Lawlor, Youngstown, Ohio.
(60)	56,981	E. L. Lawlor, Youngstown, Ohio.

OCEAN RATES FROM NEW YORK ON TIRES, TUBES, MECHANICAL GOODS, CLOTHING, FOOTWEAR AND DRUGGISTS' SUNDRIES[1]

(Same rates apply from other Atlantic ports where service is available.)

Country and Port	Rates Cu. Ft.	Rates 100 lbs.
AFRICA		
AFRICA, EAST COAST—		
Beira	..	*$26.00
Plus landing charges $0.30 per ton.		
Kilindini	..	*34.40
Delagoa Bay, Lourence Marques	..	*25.40
Mauritius	..	*30.00
NORTH COAST—		
All ports	..	*22.00
EGYPT—		
Alexandria	..	*22.00
SOUTH COAST—		
Algoa Bay	..	*23.60
Capetown	..	*23.00
East London	..	*24.20
Port Natal	..	*24.80
WEST COAST—		
Accra-Lagos, Secondi, Buruttu	..	*30.00
Dakar, Freetown	..	*28.00
Boma, Matadi	..	*32.00
ASIA		
CHINA—		
Hongkong, Shanghai	..	*23.00
INDIA—		
All direct ports	..	*21.00
Madras, Rangoon	..	*23.00
JAPAN—		
All direct ports	..	*23.00
JAVA—		
All ports	..	*21.00
MANCHURIA—		
Dalny	..	*24.00
PHILIPPINES—		
Manila	..	*23.00
STRAITS SETTLEMENTS—		
Singapore, Penang	..	*21.00
SYRIA—		
Beyrout	..	*24.00
CENTRAL AMERICA		
COSTA RICA—		
Port Limon	$.64	1.31
MEXICO—		
Tampico	.52½	1.05
Plus 2½c. per 100 lbs. bar dues.		
Vera Cruz, Puerto Mexico	.52½	1.05
PANAMA—		
Colon	.32	.64
Plus $1 per ton transfer charge.		
Panama	.37	.74
Plus $1 per ton transfer charge.		
SALVADOR—		
La Libertad	.79	1.42
EUROPE		
BELGIUM—		
Antwerp	.40	.75
BRITISH ISLES—		
All ports	.45	.85
Except rubber belting	.50	1.00
CANARY ISLANDS—		
Las Palmas	..	*25.00
DENMARK—		
Copenhagen	.55	1.00
ESTHONIA—		
Reval	.75	1.50
FINLAND—		
Helsingfors	.75	1.50
FRANCE—		
All Atlantic ports	.40	.75
Marseilles	..	*20.00
GERMANY—		
Hamburg, Bremen	.45	.82½
Danzig	.50	.90
GREECE—		
All ports	..	*22.00
HOLLAND—		
Rotterdam	.40	.75
Amsterdam	.40	.75
ITALY—		
Direct ports	.50	1.00
Fiume, Trieste, Venice	..	*26.00
NORWAY—		
All ports	.55	1.00
PORTUGAL—		
Lisbon	..	*20.00
Oporto	..	*25.00
RUMANIA—		
All ports	..	*25.00
SPAIN—		
All ports	..	*20.00
Gibraltar	.65	1.20
SWEDEN—		
Malmo, Stockholm	.65	1.25
Gothenburg	.55	1.00
SOUTH AMERICA		
ARGENTINA—		
Buenos Aires	..	*20.00
Rosario	..	*27.50
BRAZIL—		
Rio de Janeiro	..	*22.50
Santos	..	*20.00
Bahia	..	*24.00
Pernambuco	..	*23.50
CHILI—		
All ports	.74	1.32
COLOMBIA—		
Cartagena, Fuerto Colombia, Santa Marta	.51	1.12
Plus government charges.		
Buenaventura—		
(via direct steamer)	1.03	1.84
(via transshipment)	.98	1.75
ECUADOR—		
Guayaquil—		
(via direct steamer)	.74	1.32
(via transshipment)	.70	1.25
PERU—		
Callao, Mollendo	.74	1.32
URUGUAY—		
Montevideo	..	*20.00
VENEZUELA—		
La Guayra	.40	.65
Plus 4c per 100 kilos landing charge, plus 40% surcharge.		
NEW ZEALAND—		
All ports	..	*30.00
WEST INDIES		
BERMUDA—		
Hamilton	.37	.75
Grenada, St. Croix, St. Thomas, St. Kitts	.50	1.00
Port of Spain	.40	.75
CUBA—		
Havana	.47	.94
Plus 30c per 100 lbs. Cuban wharfage and handling charges.		
Santiago	.59	1.18
Cienfuegos	.61	1.21
CURACAO—		
Curacao	.30	.65
Plus 40% surcharge.		
JAMAICA—		
Kingston	.42	.84
PORTO RICO—		
All ports	.31	.75
San Juan landing charge 1c per ft., or 2½c per 100 lbs. additional.		
SANTO DOMINGO—		
Santo Domingo	.51	.91

[1]Compiled by Austin Baldwin & Co., Inc., foreign freight contractors, 44 Whitehall st., New York, N. Y.

*Rate figured on ton of 40 cubic feet or 2,240 lbs.

THE MARKET FOR RUBBER SCRAP

NEW YORK

THERE is practically no market in rubber scrap. The crude rubber situation is the despair of both the scrap dealer and the reclaimer. Orders have practically ceased in these lines with small prospect of better business in the near future.

QUOTATIONS FOR CARLOAD LOTS DELIVERED

July 25, 1921

Prices subject to change without notice

BOOTS AND SHOES			
Arctic tops	lb.	*$0.075	@
Boots and shoes	lb.	*.03½	@ .04
Trimmed arctics	lb.	*.02¾	@ .03
Untrimmed arctics	lb.	*.02	@ .02¼
HARD RUBBER			
Battery jars, black compound	lb.	*.07½	@ .01
No. 1, bright fracture	lb.	*.12	@ .15
INNER TUBES			
No. 1	lb.	*.06	@ .06¼
Compounded	lb.	*.04¼	@ .04½
Red	lb.	*.04¼	@ .04¾
MECHANICALS			
Black scrap, mixed, No. 1	lb.	*.02¼	@ .03
No. 2	lb.	*.01½	@ .02
Car springs	lb.	*.02½	@ .03
Heels	lb.	*.02½	@ .03
Horse-shoe pads	lb.	*.02¼	@ .03
Hose, air brake	lb.	*.01	@ .01¼
fire, cotton lined	lb.	*.01	@
garden	lb.	.07	@ .01
Insulated wire stripping, free from fiber	lb.	*.01½	@ .02
Matting	lb.	*.01	@
Red packing	lb.	*.04½	@ .05
Red scrap, No. 1	lb.	*.07	@ .08
No. 2	lb.	*.05½	@ .06
White scrap, No. 1	lb.	*.07	@ .07½
No. 2	lb.	*.06	@ .06¼
TIRES			
PNEUMATIC—			
Auto peelings	lb.	*.02	@ .02¼
Bicycle	lb.	*.01½	@ .02
Standard white auto	lb.	*.02¼	@ .02¾
Mixed auto	lb.	*.01	@ .01½
Stripped, unguaranteed	lb.	*.01	@ .01½
White, G. & G., M. & W., and U. S.	lb.	*.02¾	@
SOLID—			
Carriage	lb.	*.02¼	@ .02¾
Iron	lb		@
Truck, clean	lb.	*.01½	@ .02

*Nominal.

Review of the Crude Rubber Market

NEW YORK

THE firm market tendency shown early in July was due to settlement time in London and local short-covering. Some rubber was sold to factories who were attracted by the low prevailing prices, but when the market advanced slightly they withdrew, indicating a belief in lower prices.

On July 2, spot first latex crêpe sold for 14 cents; with futures ranging from 14¾ cents for September and 16 cents for December, to 17 cents for January, 1922. Spot ribbed smoked sheets sold for 12 cents on July 2, and future quotations were 12¾ for September, 14 cents for December, and 14½ cents for January, 1922.

Following the Rubber Growers Association's announcement of a 50 per cent crop reduction, the market stiffened and large operators refused to sell, resulting in many buying orders being cabled to the Far East. All large holders of rubber believed that the low prevailing prices were ended, and refused to accept factory business only at advanced prices. With greatly reduced rubber arrivals and better banking facilities the importers are apparently able to carry rubber and avoid further losses.

As the month progressed, the market developed strength, thus renewing the interest of both seller and buyer. As the result there was considerable activity in which factories and dealers contributed to give added strength to the market that continued to hold firmly despite several large arrivals.

On July 23, spot first latex crêpe sold for 16 cents with futures ranging from 16½ cents for September and 17½ for December, to 18½ cents for January, 1922. Spot ribbed smoked sheets sold for 14½ cents on July 23, and future quotations were 15 cents for September, 15¾ cents for December and 16¾ cents for January, 1922.

Brazilian Parás have moved upward in sympathy with the market for plantations, spot upriver fine advancing from 16 cents on July 2, to 17 cents on July 23.

Imports of all grades during June were 13,477 tons, compared with 14,881 tons last year. Plantation arrivals for June were 12,361 tons, compared with 12,911 tons a year ago. Total imports of all grades for the first six months of 1921 were 78,712 tons, compared with 151,889 tons for the same period in 1920.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. July 2. Spot, first latex crêpe, 14 to 14½ cents; July—September, 14¾ cents; October—December, 16 cents. July 23. Spot, first latex crêpe, 15½ cents; August—September, 15¾ cents; October—December, 16½ cents; January—March, 17½ cents.

July 2. Spot, ribbed smoked sheets, 12 @ 12½ cents; July—September, 12¾ cents; October—December, 14 cents. July 23. Spot, ribbed smoked sheets, 14½ cents; August—September, 14¾ cents; October—December, 15¼ cents; January—March, 16½ cents.

July 2. Spot, No. 1 amber crêpe, 11½ cents; July—September, 12 cents; July—December, 13 cents. July 23. Spot, No. 1 amber crêpe, 13¾ cents; August—September, 14 cents; October—December, 14¾ cents; January—March, 15 cents.

July 2. Spot, No. 1 rolled brown crêpe, .08½ @ .09 cents; July—September, .09½ cents.

July 23. Spot, No. 1 rolled brown crêpe, 11¼ cents; August—September, 11¼ cents; October—December, 11¼ cents; January—March, 11¾ cents.

SOUTH AMERICAN PARÁS AND CAUCHO. July 2. Spot, upriver fine, 16 cents; islands fine, 16½ cents; upriver coarse, .08 cents; islands coarse, .08½ cents; Cametá, .07½ cents; caucho ball, .09 cents. July 23. Spot, upriver fine, 17 cents; islands fine, 16½ cents; upriver coarse, .08¼ cents; islands coarse, .08 cents; Cametá, .08¼ cents; caucho ball, 10½ cents.

NEW YORK QUOTATIONS

Following are the New York spot quotations, for one year ago, one month ago, and July 23, the current date:

	August 2, 1920	July 1, 1921	July 23, 1921
PLANTATION HEVEA			
First latex crêpe	$0.30 @	$0.14½ @	$0.15¼ @
Off latex crêpe	@	.13 @	.15 @
Amber crêpe No. 1	.29 @	.12 @	.13¾ @
Amber crêpe No. 2	.28 @	.11 @	.12¾ @
Amber crêpe No. 3	.28½ @	.10 @	.11¾ @
Brown crêpe, thick and thin	.29 @	.12½ @	.12½ @ .13
Brown crêpe, specky	.28 @	.09 @	.11½ @
Brown crêpe, rolled	.25 @	.09 @	.11¼ @
Smoked sheet, ribbed	.29½ @	.12 @ .13½	.14½ @
Smoked sheet, plain	.30 @	.11 @	.12 @
Unsmoked sheet	.25 @	.10 @	@
Colombo scrap No. 1	.23 @	.08 @	.11 @
Colombo scrap No. 2	.21½ @	.07 @	.10 @
EAST INDIAN			
Assam crêpe	@	@	@
Assam onions	@	@	@
Penang block scrap	@	@	@
PONTIANAK			
Banjermassin	.12 @	.06½ @	.06½ @ .07
Palembang	.13 @	@	.07¾ @
Pressed block	.23 @	.11 @	.09 @ .10
Sarawak	@	.05½ @	.06¼ @
SOUTH AMERICAN			
PARAS			
Upriver, fine	.34½ @ .35	.15 @ .16	.17 @ .17½
Upriver, medium	.30 @	.13 @ .14	.15½ @
Upriver, coarse	.22 @	.07 @ .08	.08½ @
Upriver, weak, fine	.30 @	.12 @	.14 @
Islands, fine	.32 @	.17 @	.16½ @
Islands, medium	.30 @	.13 @	.13½ @
Islands, coarse	.20 @	.09 @	.08 @ .08½
Cametá	.18 @	.08 @	.08¼ @
Acre Bolivian, fine	.36 @	.16 @ .16½	.17 @
Madeira, fine	.37 @	.18 @ .19	.18½ @
Peruvian, fine	.32 @	.15 @	.15½ @
Tapajos, fine	.30 @	.15 @	.15 @
CAUCHO			
Upper caucho ball	.24 @	.09 @ .10	.10 @
Lower caucho ball	.21 @	.07 @	.08¼ @
MANICOBAS			
Ceará negro heads	@	*.10 @	.10 @
Ceará scrap	@	*.04 @	.07½ @
Manicoba, 30% guarantee	@	*.10 @	.09 @
Mangabeira thin sheet	@	*.12 @	.10 @
CENTRALS			
Corinto scrap	.19 @	.06 @ .08	.10 @ .11
Central scrap	.19 @	.06 @ .08	.10 @ .11
Central scrap and strip	.17 @	.06 @ .08	.08 @ .10
Central wet sheet	.13 @	.03 @ .04	.02 @ .04
Esmeralda sausage	.19 @	.06 @ .08	.10 @ .11
Guayule, 20% guarantee	.28 @	@	@
Guayule, washed and dried	.38 @	.26 @	.25 @
AFRICANS			
Benguela, No. 1, 28½%	.14 @	.04 @	.04 @ .05
Benguela, No. 2, 32½%	@	@	.06 @
Conakry niggers	@	@	@
Congo prime, black upper	@	@	@
Congo prime, red upper	@	@	@
Kassai, black	@	@	@
red	@	@	@
Massaí sheets and strings	@	@	@
Niger flake, prime	.18¾ @	@	.11 @ .13
Rio Nunez ball	@	@	@
Rio Nunez sheets, strings	@	@	@
GUTTA PERCHA			
Gutta Siak	.24 @ .25	.13½ @ .14	.14 @ .15
Red Macassar	2.80 @	1.50 @ 2.00	2.50 @ 3.00
BALATA			
Block, Ciudad, Bolivar	.72 @	.51 @ .54	.53 @ .54
Colombia	.50 @ .51	.35 @ .38	.39 @ .40
Panama	@	.25 @ .35	.39 @ .40
Surinam sheet	.73 @	.65 @ .70	.67 @ .68
amber	.82 @	.67 @ .73	.70 @

RECLAIMED RUBBER

The demand for reclaimed rubber has not increased notably during the past month and the outlook is problematic, dependent for the most part on the revival of crude rubber prices. Reclaimers are anticipating better business by October when the steady increase in rubber manufacturing operations will have reached considerable proportions and result in increased call for reclaims, at least of the better grades. Reclaimers in general are operating at about 25 per cent of capacity.

NEW YORK QUOTATIONS

July 25, 1921.

Prices subject to change without notice.

STANDARD RECLAIMS			
Floating	$0.14	@	$0.16
Friction	.14	@	.16
Mechanical	.09	@	.11
Shoe	.11¼	@	.12¼
Tires, auto	.11¼	@	.13¼
truck	.09	@	.11
White	.14	@	.15

ANTWERP RUBBER MARKET

OSTERRIETH & CO., Antwerp, report under date of July 9, 1921.

Soon after our last market report was despatched we have experienced a better market with buyers coming in more freely, the coal strike having come to an end. Unfortunately this regain of activity did not last very long and although stocks in London decreased by a few hundred tons the better level of prices could not be maintained and we close the week at:

	Crêpes, Francs per Kilo	Sheets, Francs per Kilo
July, 1921	3.80	3.40
August	3.90	3.40
September	4.60	3.40
October	4.15	3.50
November	4.20	3.55
December	4.30	3.55
January, 1922	4.50	3.55
February	4.60	3.65
March	4.60	3.75
April	4.60	3.75
May	4.60	3.75
June	4.60	3.75

There is a certain interest for Congo rubber and bids have been made of fr. 1.50 for Kasai Lcanda II and fr. 2.50 for Prime Black Kasai; these prices have been found too low by the owners and no business resulted so far.

Stock to-day: about 1,971 tons.

HAMBURG RUBBER MARKET

Effektin-Rohgummimakler-Verein, Hamburg, report, under date of June 25, 1921.

Although prices were lower owing to the continuation of the coal strike in England, business during this week was quite active. Both new purchases by manufacturers and filling of contracts took place, as well as considerable transactions for later delivery.

Arrivals were normal; sales took place in nearly all plantation grades as well as in fine Pará and caucho ball. The following prices were quoted:

	Marks
First latex crêpe	19.50@ 21
Ribbed smoked sheets	17.50@ 19
Ribbed smoked sheets, lower grade	14.50@ 16.50
Brown crêpe, clean	14.50@ 15.50
Brown crêpe, somewhat barky	12.50@ 14
Dark crêpe	10.50@ 12.50
Hard fine Pará	25 @ 27
Caucho ball	15.50@ 16.50
Panama and Colombia block balata	55 @ 75
No. 1 balata sheet	100 @105
Jelutong	12 @ 14

COMPARATIVE LOW AND HIGH NEW YORK SPOT RUBBER PRICES

	July 1921*			July 1920			July 1919		
PLANTATIONS									
First latex crêpe	$0.14	@	$0.17	$0.30	@	$0.35¼	$0.63	@	$0.63
Smoked sheet ribbed	.11½	@	.15¼	.29½	@	.35	.62	@	.62
PARAS									
Upriver, fine	.15½	@	.17½	.34½	@	.35½	.68	@	.68
Upriver, coarse	.07½	@	.09	.22	@	.32	.40	@	.40
Islands, fine	.16	@	.17	.33	@	.37	.59	@	.59
Islands, coarse	.07	@	.09	.21	@	.31	.27	@	.27
Cametá	.07¼	@	.08½	.19	@	.20½	.28	@	.28

* Figured to July 25, 1921.

AMSTERDAM RUBBER MARKET

JOOSTEN & JANSSEN, Amsterdam, report, under date of July 1, 1921: This week we may call the market firmer, with a good turnover in spot parcels, especially standard crêpe and some lower qualities. The turnover on the terminal market did not amount to much, buyers being afraid to follow upward movement. The market closed rather firm, prices being as follows:

Crêpe, Fl. .41	Sheets, Fl. .38 on the spot.
Crêpe, Fl. .42½	Sheets, Fl. .39½ July—September.
Crêpe, Fl. .46½	Sheets, Fl. .43½ October—December.
Crêpe, Fl. .50	Sheets, Fl. .46 January—March.

SINGAPORE RUBBER MARKET

GUTHRIE & CO., Limited, Singapore, report under date of June 10, 1921:

The rubber market continues in a dull and depressed condition, with gradually declining values. At the weekly auctions, held yesterday, prices of most grades were ¾ cents below the level of last week, the exception being brown crêpes which were in short supply. Standard ribbed smoked sheets sold at 23 to 23½ cents, and a small quantity of Standard pale crêpes sold from 27 to 28 cents, a drop of 2½ to 3 cents on both grades. Off quality sheet was difficult of sale at 3 cents down, while off latex crêpe, although readily disposed of, declined 3½ to 4 cents in the week. Browns were steady at a cent down. Dark and barky crêpes declined heavily, and it is questionable whether it is worth while preparing these grades at present values: 991 tons were catalogued at 403 tons sold. The following is the course of values:

	In Singapore per pound			Sterling Equivalent per pound in London		
Sheet, fine ribbed smoked	23	@	23½	—/ 8½	@	—/ 8⅝
Sheet, good ribbed smoked	14	@	22½	—/ 6	@	—/ 8⅜
Crêpe, fine pale	27	@	28	—/10½	@	—/10⅜
Crêpe, good pale	16½	@	26½	—/ 7⅛	@	—/10
Crêpe, fine brown	16	@	19	—/ 7	@	—/ 7⅞
Crêpe, good brown	8	@	14½	—/ 4¾	@	—/ 6⅜
Crêpe, dark	4½	@	12½	—/ 3¾	@	—/ 6
Crêpe, bark	5	@	8½	—/ 3⅛	@	—/ 4⅞

PLANTATION RUBBER EXPORTS FROM MALAYA

(These figures include the production of the Federated Malay States, but not of Ceylon.)

	January 1 to April 30, 1921			January 1 to June 9, 1921	
	Singapore	Malacca	Penang	Port Swettenham	Totals
To United Kingdom ...*pounds*	20,688,407	2,135,687	8,324,833	8,862,012	40,010,939
The Continent	4,068,939	1,739,185	67,867	59,132	5,935,423
Japan	14,802,868	.....	.....	.....	14,802,868
Ceylon	23,867	.....	88,133	196,087	308,087
United States and Canada	22,948,762	15,640	334,200	.....	23,298,602
Australia	427,028	806	.....	.....	427,834
Other countries	.....	.....	796,533	.....	796,533
Totals...*pounds*	62,959,871	3,891,618	9,611,566	9,117,231	85,580,286

Compiled by Barlow & Co., Singapore.

NEW YORK AVERAGE SPOT RUBBER PRICES

Prices in Cents Per Pound

	JUNE, 1921														JULY, 1921											
	15	16	17	18	20	21	22	23	24	25	27	28	29	30	1	2*	4†	5	6	7	8	9	11	12	13	14	15	16
PLANTATIONS:																												
Sheet:																												
Ribbed smoked	12¼	12⅜	12	12	11⅜	11⅜	11⅜	11¼	11¼	11¼	11⅜	12⅜	12⅜	12⅜	12¼	...	...	12½	12¼	12¼	12¼	12¼	13¼	14⅜	13⅜	14¼	15¼	15¼
Crêpe:																												
First latex	14¼	14⅜	14	14	13¼	13½	13⅜	13¾	13⅜	13¾	13¼	14	13⅜	14¾	14½	...	...	14⅜	14½	14¾	14¾	14¾	15⅛	16¼	15⅞	15⅞	16¾	16¾
Off latex	12¾	13¾	12¾	12¾	12⅜	12⅜	13	12½	12¼	12½	12¼	13¼	12¾	13¼	13⅛	...	...	12½	12¾	13¼	13¾	13¾	14⅛	15¼	14⅞	14¼	15¼	15¼
No. 1 blanket	11¾	11¼	11¼	11¼	11⅜	11¼	10¾	10¾	10¾	10¾	10¾	10¾	10¾	11¼	11¼	...	...	11½	11½	11½	11⅝	11½	11¾	13	12¾	12¾	13¾	13¾
No. 2 blanket	10¾	10¼	10⅜	10⅜	10⅝	10¼	9¾	9¾	10¼	9¾	10¼	10¼	10¼	10¼	10⅜	...	...	10⅜	10¼	10½	10⅝	10¼	10¾	12	11¾	11¾	12¾	12¾
No. 3 blanket	9¾	9¼	9¾	9¾	9¼	9¼	9¼	9¼	9¾	9½	9⅝	9½	9⅝	9¾	9¼	...	...	9½	9¼	9⅝	9⅝	9¼	10¼	11¼	10¾	10¾	11¾	11¾
Clean, thin, brown	10	11	10¼	10¼	10¼	10¼	10¼	10¼	10	9¾	9¾	10	10¼	11	10¾	...	...	10½	10¾	10¾	10¾	10¾	11	11½	12⅛	11¼	12¼	12¼
Specky brown	9	9¼	8¾	8¾	9¼	9¼	8¾	9¼	8⅝	8½	8¾	8¾	9¼	9⅝	9¾	...	...	9⅜	9⅝	9⅝	9½	9½	9¾	10½	10¾	10½	11¾	11⅛
Rolled brown	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	9	9	...	...	8¾	8¾	9¼	9½	9½	9¼	10¼	10¼	10¼	10¾	10¾

*Trade closed. †Holiday.

FEDERATED MALAY STATES RUBBER EXPORTS

An official report from Kuala Lumpur states that 7,658 tons of rubber were exported from the Federal Malay States in May, as against 7,444 tons in April and 7,627 tons in the corresponding month last year. The total exports for five months of the current year amount to 35,686 tons compared with 46,426 tons last year and 43,623 tons in 1919. Appended are the comparative statistics.

	1919	1920	1921
January ..... *tons*	7,163	11,119	7,085
February	10,809	9,781	6,091
March	10,679	9,524	7,408
April	7,664	8,375	7,444
May	7,308	7,627	7,658
Totals ..... *tons*	43,623	46,426	35,686

STRAITS SETTLEMENTS RUBBER EXPORTS

An official report from Singapore states that 8,813 tons of plantation rubber (transhipments 1,138 tons) were exported from Straits Settlements ports in the month of May, as compared with 6,091 tons in April and 15,617 tons in the corresponding month last year. The total exports for five months of the current year amount to 33,801 tons as against 61,820 tons last year and 77,666 tons in 1919. Appended are the comparative statistics:

	1919	1920	1921
January ..... *tons*	14,404	13,125	5,809
February	15,661	17,379	5,813
March	20,908	5,931	7,275
April	10,848	9,768	6,091
May	15,845	15,617	8,813
Totals ..... *tons*	77,666	61,820	33,801

These figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

CEYLON RUBBER EXPORTS

	January 1 to May 25	
	1920	1921
To United Kingdom ..... *pounds*	13,715,086	13,993,304
Belgium	106,830	249,904
France	223,107	317,900
Germany	108,228	1,653,548
Holland	28	359,021
Denmark	.....	51,565
Italy	89,600	90,720
Norway	.....	2,240
Western Australia	56	.....
Victoria	5,440	107,970
New South Wales	158,294	73,880
United States	18,377,042	17,413,718
Canada and Newfoundland	425,600	419,148
India	586	8,132
Straits Settlements	44,800	.....
Japan	155,427	140,146
Totals ..... *pounds*	33,410,124	34,881,196

Compiled by the Ceylon Chamber of Commerce.

PLANTATION RUBBER EXPORTS FROM JAVA*

	April		Four Months ended April	
	1920	1921	1920	1921
To Netherlands ..... *kilos*	471,000	691,000	1,529,000	2,852,000
Great Britain	1,157,000	1,596,000	2,324,000	3,852,000
Germany	18,000	28,000	18,000	145,000
Belgium	.....	.....	.....	5,000
Italy	.....	.....	.....	1,000
United States	1,005,000	488,000	5,679,000	2,391,000
Singapore	538,000	122,000	1,689,000	1,047,000
Japan	47,000	.....	178,000	95,000
Australia	16,000	.....	16,000	209,000
Totals ..... *kilos*	3,252,000	2,925,000	11,433,000	10,597,000
Ports of origin:				
Tandjong Priok ..... *kilos*	1,339,000	1,227,000	5,371,000	4,846,000
Samarang	36,000	36,000	185,000	131,000
Soerabaya	1,737,000	1,532,000	5,472,000	4,774,000

*The March figures are verified.

CRUDE RUBBER ARRIVALS AT ATLANTIC PORTS AS STATED BY SHIPS' MANIFESTS

PARAS AND CAUCHO AT NEW YORK

	Fine	Medium	Coarse	Caucho	Totals Pounds
MAY 27. By the S. S. "La Place" from Manáos.					
Paul Bertuch	92,325	4,886	6,065	.....	103,276
JUNE 14. By the S. S. "Denis" from Manáos.					
Paul Bertuch	45,864	4,508	2,849	159	53,380
Poel & Kelly	44,883	12,892	12,347	45,850	115,972
JUNE 16. By the S. S. "Virgil" from Pará.					
Paul Bertuch	67,560	23,218	5,016	44,404	140,198
Poel & Kelly	.....	935	21,639	.....	22,574
General Rubber Co.	.....	.....	.....	.....	22,400*
JUNE 24. By the S. S. "Polycarp" from Pará.					
Meyer & Brown, Inc.	42,560	.....	.....	.....	42,560†
JUNE 24. By the S. S. "Polycarp" from Manáos.					
H. A. Astlett & Co.	60,000	.....	.....	.....	60,000
Paul Bertuch	15,449	.....	.....	.....	15,449
Poel & Kelly	90,597	5,123	4,570	45,040	145,330
JUNE 26. By the S. S. "Manchurian Prince," from Pará.					
Meyer & Brown, Inc.	56,000	.....	.....	.....	56,000†
JULY 6. By the S. S. "Lake Fackler" from Pará.					
Poel & Kelly	22,359	108	6,944	.....	29,411
Paul Bertuch	6,746	11,550	.....	.....	18,296
JULY 14. By the S. S. "La Lande" from Manáos.					
Meyer & Brown, Inc.	91,840	.....	.....	.....	91,840†
JULY 14. By the S. S. "La Lande" from Pará.					
H. A. Astlett & Co.	70,000	.....	.....	.....	70,000
Paul Bertuch	.....	11,463	.....	.....	11,463
G. Amsinck & Co., Inc.	.....	.....	3,630	.....	3,630
Poel & Kelly	.....	6,783	9,587	.....	16,370
Baring Brothers	772	11,350	.....	.....	12,122

*Cameta. †Includes medium.

PLANTATIONS

(Figured at 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds	Totals
JUNE 20. By the S. S. "Clan MacInnes" at New York.				
Paul Bertuch	Colombo	New York	7,075	
H. A. Astlett & Co.	Colombo	New York	22,000	
L. Littlejohn & Co., Inc.	Colombo	New York	156,800	185,875
JUNE 21. By the S. S. "Eastern Exporter" at New York.				
Various	Colombo	New York	33,320	
L. Littlejohn & Co., Inc.	Singapore	New York	44,800	78,120
JUNE 2?. By the S. S. "Yapalaga" at New York.				
Poel & Kelly	Rotterdam	New York	47,520	47,520
JUNE 22. By the S. S. "Egremont Castle" at New York.				
Thornett & Fehr	Singapore	New York	126,000	
L. Littlejohn & Co., Inc.	Singapore	New York	660,800	
Jaeger & Co.	Singapore	New York	50,400	
East Asiatic Co., Inc. ...	Singapore	New York	86,400	
Thomas A. Desmond & Co.	Singapore	New York	86,400	
F. R. Henderson & Co..	Singapore	New York	252,000	
Paterson, Simmons & Co.	Singapore	New York	19,260	
General Rubber Co.	Singapore	New York	53,640	
Meyer & Brown, Inc.	Singapore	New York	120,960	
Various	Singapore	New York	622,780	2,078,640
JUNE 22. By the S. S. "Kandahar" at New York.				
J. T. Johnstone & Co., Inc.	Singapore	New York	176,896	
Eastern Rubber Co.	Singapore	New York	50,400	
Chas. T. Wilson Co., Inc.	Singapore	New York	369,180	
Baird Rubber & Trading Co.	Singapore	New York	315,000	
L. Littlejohn & Co., Inc.	Singapore	New York	1,657,800	
William H. Stiles & Co.	Singapore	New York	190,400	
Poel & Kelly	Singapore	New York	690,300	
Smith & Schippers, Inc..	Singapore	New York	100,800	
Fred Stern & Co.	Singapore	New York	45,347	
H. A. Astlett & Co.	Singapore	New York	670,000	
Rogers-Pyatt Shellac Co.	Singapore	New York	45,000	
Fred Waterhouse & Co..	Singapore	New York	21,240	
F. R. Henderson & Co..	Singapore	New York	254,340	
East Asiatic Co., Inc.	Singapore	New York	414,900	
Baring Bros.	Singapore	New York	259,200	
Raw Products Co.	Singapore	New York	54,000	
Thomas A. Desmond & Co.	Singapore	New York	37,800	
Phelan, Borland & Fearons	Singapore	New York	54,900	
Continental Rubber Co. of New York	Singapore	New York	22,320	
Pacific Trading Co.	Singapore	New York	23,040	
Huth & Co.	Singapore	New York	328,320	
General Rubber Co.	Singapore	New York	26,820	
Rubber Importers & Dealers Co., Inc.	Singapore	New York	110,880	
McAllister Bros.	Singapore	New York	80,640	
Habicht & Co.	Singapore	New York	34,560	
American Trading Co..	Singapore	New York	26,820	
Thornett & Fehr	Singapore	New York	135,000	
Firestone Tire & Rubber Co.	Singapore	Akron	201,600	
Various	Singapore	New York	354,637	
J. T. Johnstone & Co., Inc.	Malacca	New York	18,000	
The Goodyear Tire & Rubber Co.	Pt. Swettenham	Akron	167,580	
Meyer & Brown, Inc...	Penang	New York	9,900	
L. Littlejohn & Co., Inc.	Penang	New York	266,400	
Edward Boustead & Co.	Penang	New York	28,800	
William H. Stiles & Co.	Penang	New York	9,900	
Various	Penang	New York	111,960	
F. R. Henderson & Co..	Belawan-Deli	New York	18,000	
General Rubber Co.	Belawan-Deli	New York	42,300	
Various	Belawan-Deli	New York	142,920	7,567,900
JUNE 23. By the S. S. "City of York" at New York.				
Chas. T. Wilson & Co..	Colombo	New York	181,440	
Poel & Kelly	Colombo	New York	7,560	
Baring Bros.	Colombo	New York	252,000	
Smith & Schipoers, Inc.	Colombo	New York	112,680	
Goschen & Cumliffe	Colombo	New York	46,080	
Baird Rubber & Trading Co.	Colombo	New York	62,100	
A. Latham & Co.	Colombo	New York	49,860	

	Shipment from:	Shipped to:	Pounds	Totals
Meyer & Brown, Inc...	Colombo	New York	257,600	
L. Littlejohn & Co., Inc.	Colombo	New York	504,000	
Various	Colombo	New York	10,490	
Hood Rubber Co.....	London	Watertown	33,600	1,517,410
JUNE 23. By the S. S. "City of York" at Boston.				
Hood Rubber Co.....	Colombo	Watertown	170,990	170,990
JUNE 23. By the S. S. "Edgar F. Luckenbach" at New York.				
Various	Rotterdam	New York	35,100	35,100
JUNE 26. By the S. S. "Montauk," at New York.				
F. R. Henderson & Co.	London	New York	27,540	27,540
JUNE 26. By the S. S. "Ryndam" at New York.				
Meyer & Brown, Inc....	Rotterdam	New York	112,060	
Various	Rotterdam	New York	149,520	
L. Littlejohn & Co., Inc.	Amsterdam	New York	156,800	418,320
JUNE 26. By the S. S. "Celebes" at New York.				
Various	T'jong Priok..	New York	58,300	
L. Littlejohn & Co., Inc.	Java	New York	206,800	
M. E. Borren.....	Batavia	New York	9,900	
Various	Batavia	New York	4,475	
William H. Stiles & Co.	Singapore	New York	11,200	290,675
JUNE 27. By the S. S. "Editor" at New York.				
Paul Bertuch.....	Rotterdam	New York	25,740	
A. C. Spencer Hess.....	Rotterdam	New York	121,320	
Various	Rotterdam	New York	92,747	
L. Littlejohn & Co., Inc.	London	New York	224,823	
Hood Rubber Co.....	London	Watertown	22,450	487,080
JULY 2. By the S. S "Jersey City" at New York.				
Vernon Metal & Produce Co.	Colombo	New York	58,880	
L. Littlejohn & Co., Inc.	London	New York	112,000	170,880
JULY 2. By the S. S. "Nieuw Amsterdam" at New York.				
Harburger & Stack.....	Rotterdam	New York	72,360	
Poel & Kelly.....	Rotterdam	New York	9,900	
Various	Rotterdam	New York	70,560	152,820
JULY 5. By the S. S. "Frederick J. Luckenbach" at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	11,200	11,200
JULY 6. By the S. S. "Menominee" at New York.				
Various	London	New York	5,760	5,760
JULY 10. By the S. S. "Noordam" at New York.				
Meyer & Brown, Inc....	Rotterdam	New York	44,800	44,800
JULY 15. By the S. S. "Telemachus" at New York.				
Pablo Calvet & Co.....	Penang	New York	70,920	
Smith & Schippers, Inc.	Penang	New York	30,240	
Various	Penang	New York	136,440	
Meyer & Brown, Inc...	Colombo	New York	235,200	
Various	Colombo	New York	127,980	
Wilson, Holgate & Co., Limited	Deli	New York	237,240	
Eastern Rubber Co.....	Deli	New York	89,640	
Pell & Dumont, Inc.....	Deli	New York	30,600	
Various	Deli	New York	27,900	
Various	Telok Neboeng.	New York	650,160	
Firestone Tire & Rubber Co.	Singapore	Akron	201,960	
Hood Rubber Co.....	Singapore	Watertown	26,100	
S. W. Bridges & Co., Inc.	Singapore	Boston	43,560	
J. T. Johnstone & Co., Inc.	Singapore	New York	136,650	
Chas. T. Wilson Co., Inc.	Singapore	New York	316,800	
Jaeger & Co.....	Singapore	New York	80,640	
F. R. Henderson & Co..	Singapore	New York	142,380	
L. Littlejohn & Co., Inc.	Singapore	New York	2,083,100	
East Asiatic Co., Inc...	Singapore	New York	115,560	
Fred Stern & Co.....	Singapore	New York	33,600	
Poel & Kelly.....	Singapore	New York	637,389	
H. Muehlstein & Co	Singapore	New York	138,600	
Wilson, Holgate & Co., Limited	Singapore	New York	27,000	
Rubber Importers & Dealers Co., Inc.....	Singapore	New York	218,880	
Thornett & Fehr.....	Singapore	New York	90,000	
Phelan, Borland & Fearons	Singapore	New York	254,340	
William H. Stiles & Co.	Singapore	New York	134,400	
Rubber Trading Co.....	Singapore	New York	197,460	
John D. Lewis.....	Singapore	New York	189,900	
W. P. Mills.....	Singapore	New York	64,620	
Henderson, Forbes & Co.	Singapore	New York	46,080	
Peninsular Trading Agency, Inc.....	Singapore	New York	32,760	
Goschen & Cumliffe.....	Singapore	New York	151,200	
Smith & Schippers, Inc.	Singapore	New York	100,800	
Adolph Hirsch & Co....	Singapore	New York	22,400	
Edward Boustead & Co..	Singapore	New York	54,000	
Meyer & Brown, Inc....	Singapore	New York	168,000	
General Rubber Co.....	Singapore	New York	261,900	
H. A. Astlett & Co.....	Singapore	New York	170,000	
Continental Rubber Co. of New York.....	Singapore	New York	78,400	
The Fisk Rubber Co....	Singapore	Chicopee Falls	388,326	
Various	Singapore	New York	802,424	9,045,540
JULY 16. By the S. S. "Saxonia" at New York.				
Goldman, Sachs & Co...	London	New York	2,675,160	2,675,160
JULY 16 By the S. S. "City of Dunkirk" at New York.				
Smith & Schippers, Inc.	Penang	New York	20,160	
Edward Boustead & Co.	Penang	New York	28,800	
Baird Rubber & Trading Co	Penang	New York	99,000	
Wilson, Holgate & Co., Limited	Penang	New York	137,880	
General Rubber Co....	Penang	New York	10,800	
Various	Penang	New York	27,609	
William H. Stiles & Co.	Singapore	New York	44,800	
Poel & Kelly.....	Singapore	New York	352,980	
L. Littlejohn & Co., Inc.	Singapore	New York	908,200	
Fred Stern & Co.....	Singapore	New York	86,408	
Eastern Rubber Co.....	Singapore	New York	47,880	
Baring Brothers.....	Singapore	New York	252,540	
F. R. Henderson & Co..	Singapore	New York	148,860	
Jaeger & Co.....	Singapore	New York	72,000	
General Rubber Co.....	Singapore	New York	150,840	
The Fisk Rubber Co....	Singapore	Chicopee Falls	201,749	
Eastern Asiatic Co., Inc.	Singapore	New York	27,000	
Aldens' Successors, Inc.	Singapore	New York	46,260	
Smith & Schippers, Inc..	Singapore	New York	192,600	
Fred Waterhouse Co., Limited	Singapore	New York	9,000	
American Trading Co...	Singapore	New York	277,740	
Ajax Rubber Co., Inc...	Singapore	New York	40,140	
Huth & Co.....	Singapore	New York	84,960	
J. T. Johnstone & Co., Inc.	Singapore	New York	123,167	
Edward Boustead & Co..	Singapore	New York	56,160	
Thornett & Fehr.....	Singapore	New York	180,000	
Raw Products Co.....	Singapore	New York	90,000	
Thomas A. Desmond & Co.	Singapore	New York	151,200	
John D. Lewis.....	Singapore	New York	144,000	
Chas. T. Wilson Co., Inc.	Singapore	New York	183,600	
H. Muehlstein.....	Singapore	New York	54,000	
Phelan, Borland & Fearons	Singapore	New York	80,280	
Baird Rubber & Trading Co.	Singapore	New York	115,200	
Meyer & Brown, Inc...	Singapore	New York	721,280	
Firestone Tire & Rubber Co.	Singapore	Akron	202,320	
H. A. Astlett & Co.....	Singapore	New York	200,000	
Meyer & Brown, Inc....	Medan	New York	56,000	
Hood Rubber Co.....	London	Watertown	33,607	5,659,020
JULY 18. By the S. S. "Westerdijk" at New York.				
Various	Rotterdam	New York	265,500	265,500
JULY 21 By the S. S. "City of Chester" at New York.				
Continental Rubber Co. of New York.....	Colombo	New York	22,400	
Hood Rubber Co.....	Colombo	Watertown	56,000	78,400

CENTRALS

JUNE 25. By the S. S. "Quillota" at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	600	600

PONTIANAK

JUNE 22. By the S. S. "Egremont Castle" at New York.				
Various	Singapore	New York	116,100	116,100
JUNE 22. By the S. S. "Kandahar" at New York.				
H. A. Astlett & Co.....	Singapore	New York	20,400	20,400

AFRICANS

JULY 7. By the S. S. "Londonier" at New York.				
Various	Antwerp	New York	59,800	59,800

GUTTA PERCHA

JUNE 22. By the S. S. "Egremont Castle" at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	72,300	72,300
JUNE 22. By the S. S. "Kandahar" at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	31,500	31,500

GUTTA SIAK

JUNE 22. By the S. S. "Egremont Castle" at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	64,200	64,200
JUNE 22. By the S. S. "Kandahar" at New York.				
Various	Singapore	New York	60,000	60,000

BALATA

JUNE 21. By the S. S. "Allianca" at New York.				
E. Heaney & Co.....	Cristobal	New York	10,200	
Mecke & Co.....	Cristobal	New York	2,400	12,600
JUNE 23 By the S. S. "Polycarp" at New York.				
Various	Pará	New York	1,200	1,200
JUNE 25. By the S. S. "Quillota" at New York.				
Ultramares Corporation.	Cristobal	New York	1,200	
Various	Cristobal	New York	1,500	2,700
JUNE 28. By the S. S. "Maraval" at New York.				
Boos & Co.....	Port of Spain	New York	5,760	5,760
JUNE 29. By the S. S. "General W. C. Gorgas."				
Fromm & Co.....	Cristobal	New York	1,650	1,650
JUNE 30. By the S. S. "Aurora" at New York.				
William Schall & Co....	Caracas	New York	2,100	
Middleton & Co., Limited	Caracas	New York	4,950	7,050
JULY 6. By the S. S. "Lake Fackler" at New York.				
Arkell & Douglas, Inc..	Cayenne	New York	1,800	
Middleton & Co., Limited	Cayenne	New York	2,850	
Wm. Schall & Co.....	Cayenne	New York	7,050	11,700
JULY 12. By the S. S. "Matura" at New York.				
Arkell & Douglas, Inc...	Trinidad	New York	23,700	23,700
JULY 19. By the S. S. "Hebe" at New York.				
Wm. Schall & Co.....	Caracas	New York	2,550	
Middleton & Co., Limited	Caracas	New York	1,350	3,900

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF APRIL, 1921

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires: Casings Value	Automobile Tires: Inner Tubes Value	Automobile Tires: Solid Tires Value	Automobile Tires: All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
EUROPE																
Azores and Madeira Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$38	.....	.....	$38
Belgium	$365	$3,828	$555	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,222	.....	$4,486	11,456
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	$125	.....	.....	.....	.....	.....	125
Denmark	.....	.....	219	.....	.....	2,204	$2,938	$286	$10,794	46	.....	.....	1,000	$120	1,531	16,934
Finland	1,016	181	.....	.....	.....	.....	.....	.....	1,250	.....	$650	.....	.....	.....	81	3,178
France	323	498	288	.....	.....	600	668	.....	203	63	.....	.....	1,823	2,892	24,878	31,636
Germany	.....	.....	.....	.....	.....	19	17	.....	.....	.....	.....	$358	.....	.....	.....	375
Gibraltar	.....	.....	.....	.....	.....	.....	.....	.....	141	17	.....	.....	.....	.....	.....	158
Greece	.....	.....	.....	.....	.....	32	46	.....	1,640	695	.....	.....	1,028	.....	148	3,557
Iceland and Faroe Islands	.....	.....	.....	.....	.....	468	787	.....	.....	.....	.....	.....	.....	.....	.....	787
Italy	.....	48	.....	.....	.....	.....	.....	.....	.....	20	.....	100	17,421	54	910	18,553
Malta, Gozo and Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	.....	2,133	4	.....	.....	.....	.....	.....	2,137
Netherlands	40	340	165	60	$177	.....	.....	245	2,673	639	.....	.....	11,259	816	908	17,262
Norway	680	264	.....	.....	.....	5,845	5,185	645	38,887	1,062	400	.....	124	48	309	47,624
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	530	235	.....	.....	33,242	71	31	34,109
Portugal	.....	300	.....	96	442	.....	.....	.....	.....	.....	.....	.....	2,220	.....	20	2,982
Roumania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	114	.....	119
Spain	.....	.....	.....	.....	.....	.....	.....	564	46,787	153	350	58	4,624	125	4,535	57,196
Sweden	1,145	.....	.....	1,047	4,031	402	469	.....	47,773	1,961	2,569	4,913	321,832	187	7,060	391,940
Switzerland	622	.....	.....	.....	.....	.....	.....	.....	1,548	256	.....	.....	2,946	.....	2,129	7,501
Turkey in Europe	.....	.....	.....	.....	.....	.....	.....	.....	27	7	.....	.....	75	.....	.....	109
England	116	16,072	1,659	714	2,459	576	828	3,169	79,885	8 949	829	.....	23,522	21,247	89,446	248,181
Scotland	.....	.....	234	.....	.....	7,790	5,849	.....	.....	.....	.....	.....	3,595	.....	25	9,703
TOTALS, EUROPE	$4,307	$21,531	$3,120	1,917	$7,109	17,936	$16,787	$4,909	$234,271	$14,252	$4,798	$5,429	$426,976	$25,674	$136,497	$905.660
NORTH AMERICA																
Bermuda	.....	$74	.....	.....	.....	633	$987	$269	.....	.....	.....	$146	$967	$124	$31	$2,598
British Honduras	.....	16	.....	.....	.....	1,090	1,783	6	$365	$146	.....	.....	45	6	31	2,398
Canada	$12,061	3,732	$5,272	2,785	$9,597	2,177	2,759	258	40,863	3,353	$2,163	9,300	16,297	15,009	179,310	299,974
Costa Rica	2,023	105	617	.....	.....	.....	.....	624	505	41	.....	115	2,758	168	1,016	7,973
Guatemala	.....	1,920	39	.....	.....	134	163	385	1,340	223	.....	.....	1,801	430	410	6,711
Honduras	125	2,052	103	.....	.....	1,114	1,669	193	1,581	428	.....	218	2,290	210	291	9,160
Nicaragua	1,704	118	188	.....	.....	216	268	359	1,437	311	.....	.....	391	144	95	5,015
Panama	.....	4,638	80	72	225	476	444	2,527	7,669	1,120	2,408	2,050	4,898	687	2,652	29,398
Salvador	.....	22	.....	.....	.....	610	600	2,389	.....	15	.....	.....	1,507	.....	46	4,579
Mexico	31,676	26,362	17,305	108	566	25,656	31,135	4,645	135,777	19,808	4,894	2,617	42,038	7,389	45,470	369,682
Miquelon, Langley, etc	.....	.....	.....	980	3,270	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,270
Newfoundland and Labrador	152	91	.....	2,712	8,887	618	596	170	2,447	358	.....	56	69	20	77	12,923
Barbados	.....	.....	.....	.....	.....	52	60	.....	2,012	62	150	.....	.....	.....	223	2,507
Jamaica	$3	881	.....	.....	.....	1,252	1,115	.....	4,636	196	992	.....	401	348	375	8,997
Trinidad and Tobago	.....	353	459	3	12	4	5	.....	6,796	1,386	1,445	81	1,969	30	225	12,761
Other British West Indies	6	799	90	.....	.....	275	318	148	545	104	.....	.....	173	.....	363	2,546
Cuba	2,759	12,968	3,075	.....	.....	6,459	5,371	3,199	140,652	9,838	9,402	1,239	86,732	6,683	15,501	297,419
Virgin Islands of United States	.....	20	41	.....	.....	490	654	.....	512	228	7,582	105	.....	2	69	9,213
Dutch West Indies	.....	.....	46	.....	.....	352	472	39	1,077	68	.....	48	139	5	77	1,971
Haiti	.....	429	385	.....	.....	144	170	.....	.....	64	.....	.....	308	111	546	2,013
Dominican Republic	124	921	1,293	.....	.....	2,692	3,771	398	12,326	979	.....	57	2.716	11	563	23,159
TOTALS, NORTH AMERICA	$50,683	$55,502	$28,993	6,660	$22,557	44,444	$52,340	$15,609	$360,540	$38,728	$29,036	$16,032	$165,499	$31,377	$247,371	$1,114,267
OCEANIA																
Australia	$4,149	$1,995	$4,280	433	$1,646	1,083	$1,600	.....	$7,250	$3,772	$821	.....	$8,847	$1,218	$4,851	$40,429
New Zealand	2,045	357	279	.....	.....	336	356	$3,175	29,357	1,475	6,524	$2,112	9,806	1,372	3,966	60,824
Other British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	1,280	363	.....	.....	36	.....	.....	1,679
French Oceania	.....	21	17	.....	.....	96	120	.....	568	130	138	.....	.....	.....	61	1,055
Other Oceania	.....	.....	.....	.....	.....	303	488	.....	698	115	.....	.....	.....	.....	.....	1,301
Philippine Islands	8,925	2,126	145	82	270	7,954	11,339	1,109	14,896	820	3,604	1,163	4,670	131	7,625	56,823
TOTALS, OCEANIA	$15,119	$4,499	$4,721	514	$1,916	9,772	$13,903	$4,284	$54,049	$6,675	$11,087	$3,275	$23.359	$2,721	$16,503	$162,111
SOUTH AMERICA																
Argentina	$2,414	$5.319	$172	.....	.....	.....	.....	$172	$19,921	$4,125	$309	$3,683	$25,276	$655	$5,954	$68,000
Bolivia	279	3,183	.....	.....	.....	.....	.....	.....	430	101	.....	.....	.....	679	652	5,324
Brazil	.....	12,173	295	380	$557	1,218	$1,069	.....	5,853	540	776	87	36,330	1,232	1,650	60,562
Chile	1,783	1,908	.....	.....	.....	641	695	.....	5,918	529	.....	.....	5,857	12	4,388	21,090
Colombia	.....	1,733	1,264	12	36	575	561	419	3,869	286	1,546	91	7,868	60	1,454	19,187
Ecuador	465	1,693	39	.....	.....	.....	.....	.....	1,872	188	.....	.....	35	9	90	4,391
British Guiana	.....	.....	.....	.....	.....	128	106	.....	1;519	181	.....	.....	660	.....	129	2,595
Dutch Guiana	551	74	.....	.....	.....	.....	.....	226	407	83	.....	.....	.....	.....	21	1,362
French Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	768	.....	.....	768
Peru	4,122	7,930	66	36	300	49	100	143	8,871	2,248	1,195	.....	30,314	704	984	56,977
Uruguay	.....	.....	64	24	90	5,760	4,772	205	5,401	.....	229	.....	7,634	190	5	18,590
Venezuela	48	1,591	443	.....	.....	.....	.....	535	11,648	2,198	97	103	856	157	1,556	19,232
TOTALS, SOUTH AMERICA	$9,662	$35,604	$2,343	452	$983	8,371	$7,303	$1,700	$65,709	$10,479	$4,152	$3,964	$115,598	$3,698	$16,883	$278,078

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires Casings Value	Automobile Tires Inner Tubes Value	Automobile Tires Solid Tires Value	Automobile Tires All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
ASIA																
China	$887	....	....	....	....	1,170	$1,294	....	$8,601	$762	$167	....	$44,016	$1,330	$11,483	$68,540
Kwantung, leased territory	....	....	....	....	....	....	....	....	....	....	....	....	....	....	200	200
Chosen	....	....	....	....	....	120	102	....	....	....	....	....	....	....	....	102
British India	2,088	$1,508	$579	....	....	24	29	....	27,198	108	....	....	13,264	102	1,216	46,092
Straits Settlements	....	....	....	....	....	232	415	....	543	150	1,300	$697	....	420	558	4,083
Other British East Indies	....	....	....	....	....	....	....	....	1,347	30	....	....	....	....	....	1,377
Dutch East Indies	....	1,584	995	....	....	3	6	....	4,454	2,143	15,442	....	443	327	1,653	27,047
French Indo China	....	....	....	....	....	....	....	....	287	58	....	....	....	....	....	345
Hongkong	....	460	....	....	....	1,340	1,821	$196	10,303	523	190	....	....	1,607	877	15,977
Japan	....	647	5,129	6,312	$14,388	12,741	11,842	....	8,871	....	....	2	14,144	875	28,892	84,790
Persia	....	....	....	....	....	8,000	9,674	....	....	....	....	....	....	....	....	9,674
Russia in Asia	....	....	....	369	1,020	....	....	....	....	....	....	....	....	....	....	1,020
Siam	....	....	....	....	....	....	....	....	2,300	290	....	....	30	....	40	2,660
Turkey in Asia	....	....	....	....	....	14	17	....	353	118	....	....	....	19	18	525
TOTALS, ASIA	$2,975	$4,199	$6,703	6,681	$15,408	23,644	$25,200	$196	$64,257	$4,182	$17,099	$699	$71,897	$4,680	$44,937	$262,432
AFRICA:																
British West Africa	....	....	....	....	....	....	....	....	$8,691	$2,431	....	....	....	....	$11	$11,133
British South Africa	$17,116	$10,143	$1,019	72	$214	100	$243	$630	260	40	$1,312	$186	$3,803	$254	782	36,002
British East Africa	....	....	....	....	....	....	....	....	659	....	....	....	....	....	....	659
Canary Islands	....	....	....	....	....	....	....	....	988	....	....	....	63	....	....	1,051
French Africa	4,500	....	108	....	....	....	....	....	....	84	....	....	3	....	....	4,695
Portuguese Africa	935	....	....	....	....	....	....	....	....	....	....	....	20	....	....	955
Egypt	....	....	....	....	....	16	32	....	2,193	149	....	....	....	....	273	2,647
TOTALS, AFRICA	$22,551	$10,143	$1,127	72	$214	116	$275	$630	$12,791	$2,704	$1,312	$186	$3,889	$254	$1,066	$57,142
GRAND TOTALS	$105,297	$131,478	$47,007	16,296	$48,187	104,283	$115,808	$27,328	$791,617	$77,020	$67,484	$29,585	$807,218	$68,404	$463,257	$2,779,690

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES

	Belting, Hose, and Packing Value	Boots and Shoes Pairs	Boots and Shoes Value	Tires Automobile Value	Tires All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
Hawaii	$10,008	....	....	$93,317	$707	....	....	$36,271	$140,303
Porto Rico	1,050	....	....	63,079	90	....	....	5,716	69,935
TOTALS	$11,058	....	....	$156,396	$797	....	....	$41,987	$210,238

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
UNMANUFACTURED—*free*				
India rubber				
From France	864,073	$251,239	......	......
Netherlands	133,674	54,892	622,022	$103,804
Portugal	14,100	9,869	......	......
United Kingdom	8,800,914	4,233,181	3,374,461	524,827
Canada	41,880	15,009	18,000	1,800
Central America	16,462	3,855	6,681	1,318
Mexico	7,139	2,185	......	......
Brazil	5,183,214	1,499,276	1,611,408	177,074
Peru	789,052	246,707	8,377	875
Other South Am.	113,005	27,874	170,557	22,130
British E. Indies	39,262,162	19,215,266	17,628,636	3,908,880
Dutch E. Indies	9,097,239	3,785,268	2,592,966	749,640
Other countries	306,355	145,045	54,300	14,829
Totals	63,629,269	$29,489,666	26,087,408	$5,505,177
Balata	79,073	$47,037	157,667	$95,491
Guayule	105,658	22,676	......	......
Jelutong (Pontianak)	1,720,819	298,528	140,789	25,197
Gutta percha	804,191	170,350	14,474	1,489
Rubber scrap	1,852,484	108,772	146,734	8,778
Totals, unmanufactured	68,191,494	$30,137,029	26,547,672	$5,636,132
India rubber and gutta percha ....*dutiable*	......	$73,972	......	$95,913
India rubber substitutes *dutiable*	8,946	1,539	......	......
Chicle ....*dutiable*	431,718	312,998	728,896	361,682

EXPORTS OF DOMESTIC MERCHANDISE

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
MANUFACTURED				
India rubber				
Scrap and old	699,424	$41,888	643,664	$28,995
Reclaimed	288,008	49,231	59,011	6,776
Belting[1]	......	219,499	......	105,297
Hose[1]	......	205,573	......	131,478
Packing[1]	......	111,127	......	47,007
Boots[1] ....*pairs*	28,407	81,236	16,296	48,187
Shoes[1] ....*pairs*	741,788	683,417	104,283	115,808
Soles and heels[1]	......	107,290	......	27,328
Tires				
Casings[1]	......	3,148,845	......	791,617
Inner tubes[1]	......	370,520	......	77,020
Solid tires[1]	......	328,502	......	67,484
All other tires[1]	......	58,034	......	29,585
Druggists rubber sundries[1]	......	116,999	......	68,404
Sus enders and garters	......	301,538	......	48,153
Other rubber manufactures[1]	......	797,301	......	326,729
Totals, manufactured	......	$6,621,000	......	$1,919,868

EXPORTS OF FOREIGN MERCHANDISE

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
UNMANUFACTURED—				
India rubber	845,016	$238,954	1,700,839	$308,835
Balata	98,419	49,485	35,680	18,735
Gutta percha	14,560	6,860	......	......
Rubber scrap	......	......	25,293	2,529
Totals, unmanufactured	957,995	$295,299	1,761,812	$330,099
MANUFACTURED—				
Gutta percha and india rubber	......	$1,670	......	......
Totals, manufactured	......	$1,670	......	......

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
MANUFACTURED—				
To Alaska				
Belting, hose, and packing	......	$25,532	......	$9,794
Boots and shoes...*pairs*	11,385	43,133	6,667	19,200
Other rubber goods	......	6,316	......	2,410
Totals	......	$74,981	......	$31,404
To Hawaii				
Belting, hose, and packing	......	$23,324	......	$10,008
Automobile tires	......	91,783	......	93,317
Other tires	......	3,269	......	707
Other rubber goods	......	18,192	......	36,271
Totals	......	$136,568	......	$140,303
To Porto Rico				
Belting, hose, and packing	......	$27,571	......	$1,050
Automobile tires	......	58,390	......	63,079
Other tires	......	1,161	......	90
Other rubber goods	......	16,301	......	5,716
Totals	......	$103,423	......	$69,935

[1]Details of exports of domestic merchandise by countries during April, 1921, appear on this and the preceding page.

UNITED STATES CRUDE AND WASTE RUBBER IMPORTS FOR 1921 (BY MONTHS)

1921	Plantation	Farás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Balata	Miscellaneous,	Waste	Totals 1921	Totals 1920
January ..... *tons*	12,819	1,312	43	3	....	....	41	173	1,071	15,462	22,401
February	7,913	432	269	2	25	....	25	216	37	8,919	33,984
March	12,241	1,794	377	1	....	3	29	7	345	14,797	33,998
April	16,861	403	.....	5	....	....	64	226	7	17,566	24,957
May	9,127	1,570	.....	2	33	....	40	186	41	10,999	28,666
June	12,361	1,091	.....	25	....	....	49	203	72	13,801	15,606
Totals, 6 months, 1921.....	71,322	6,602	689	38	58	3	248	1,011	1,573	81,544	.....
Totals, 6 months, 1920.....	134,403	12,809	3,610	550	504	13	319	4,654	2,750	.....	159,612

Compiled by The Rubber Association of America, Inc.

CUSTOM HOUSE STATISTICS

NEW YORK

IMPORTS

	May 1920 Pounds	May 1920 Value	May 1921 Pounds	May 1921 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	296,404	$83,596	.....	.....
France	229,198	50,430	.....	.....
Netherlands	370,737	163,888	494,415	$95,660
Portugal	89,391	22,766	10,761	1,038
Spain	161,584	23,837	.....	.....
England	9,017,289	4,067,946	1,320,499	205,692
Costa Rica	223	80	.....	.....
Guatemala	380	95	.....	.....
Nicaragua	6,547	2,377	.....	.....
Panama	7,041	2,648	.....	.....
Salvador	5,710	2,642	.....	.....
Mexico	65,514	24,645	.....	.....
Cuba	44,008	15,400	.....	.....
Bolivia	5,809	2,971	.....	.....
Brazil	3,216,017	824,988	3,718,340	394,466
Colombia	32,969	17,335	234	59
Ecuador	18,034	4,104	.....	.....
British Guiana	1,295	961	.....	.....
Peru	114,308	33,794	8,541	939
Venezuela	36,547	17,009	220	45
China	149,800	59,920	.....	.....
British India	357,558	112,063	201,600	27,518
Straits Settlements	16,172,710	7,965,075	10,498,899	2,020,668
British East Indies	4,917,333	2,265,126	3,506,421	510,128
Dutch East Indies	6,981,431	3,083,450	3,515,157	645,231
British West Africa	18,473	2,609	.....	.....
Totals	42,316,310	$18,849,755	23,275,087	$3,901,444
Balata	19,127	9,033	76,506	45,679
Jelutong (Pontianak)	673,709	135,374	70,336	3,097
Gutta percha	236,194	45,135	165,209	28,170
Totals	43,245,340	$19,039,297	23,587,129	$3,978,390
Rubber scrap and reclaimed	751,095	56,642	.....	.....
Totals, unmanufactured	43,996,435	$19,095,939	23,587,129	$3,978,390
Manufactures of rubber and gutta percha	.....	$65,255	.....	$48,880
Rubber substitutes	.....	.....	242	30
Chicle *dutiable*	431,274	294,961	122,006	60,037

EXPORTS

	May 1920 Pounds	May 1920 Value	May 1921 Pounds	May 1921 Value
MANUFACTURED				
Automobile and other tires	.....	$4,253,135	.....	$605,609
Inner tubes	.....	391,995	.....	49,498
Belting, hose, and packing	.....	480,356	.....	199,609
Rubber boots and shoes. *pairs*	536,987	491,593	111,463	127,558
Soles and heels	.....	56,439	.....	21,120
Druggists' sundries	.....	234,956	.....	27,642
Other rubber manufactures	.....	495,931	.....	150,385
Totals, manufactured	.....	$6,404,405	.....	$1,181,421
Insulated wire	.....	$724,506	.....	$708,312
UNMANUFACTURED—*free*				
Rubber scrap and reclaimed	847,050	$109,741	333,715	$18,709

FOREIGN EXPORTS

Crude rubber	26,871	$11,933	34,000	$3,304
Balata	202,100	121,460	19,637	7,305
Rubber scrap and reclaimed	10,000	875	6,720	672
Rubber manufactures	.....	149	.....	438
Rubber substitutes	125	30	.....	.....

MASSACHUSETTS

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	.....	.....	11,200	$1,696
British East Indies	.....	.....	229,820	26,323
Totals, unmanufactured	.....	.....	241,020	$28,019
Rubber manufactures. *dutiable*	.....	.....	.....	$3,409

EXPORTS

	May 1920 Pounds	May 1920 Value	May 1921 Pounds	May 1921 Value
MANUFACTURED				
Automobile and other tires	.....	$17,551	.....	$303
Inner tubes	.....	249	.....	.....
Belting, hose, and packing	.....	6,282	.....	3,255
Rubber boots and shoes. *pairs*	195,156	169,436	7,226	11,793
Soles and heels	.....	14,363	.....	3,413
Druggists' sundries	.....	6,208	.....	1,059
Other rubber manufactures	.....	38,040	.....	11,560
Totals, manufactured	.....	$252,129	.....	$31,383
Insulated wire	.....	$872	.....	$2,796

BUFFALO

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Canada	.....	.....	188,262	$95,072
Rubber scrap and reclaimed	37,773	$5,052	150,370	4,628
Totals, unmanufactured	37,773	$5,052	338,632	$99,700
Rubber manufactures. *dutiable*	.....	1,453	.....	$2,784

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$57,368	.....	$124,077
Inner tubes	.....	31,698	.....	18,336
Belting, hose, and packing	.....	15,939	.....	8,732
Rubber boots and shoes—*pairs*	24	114	223	707
Soles and heels	.....	.....	.....	593
Druggists' sundries	.....	10,883	.....	7,036
Other rubber manufactures	.....	72,816	.....	66,774
Totals, manufactured	.....	$188,818	.....	$226,255
Insulated wire	.....	$4,550	.....	$4,558
Rubber scrap and reclaimed	315,803	51,782	122,863	14,961

FOREIGN EXPORTS

Crude rubber	316,985	$147,722	661,639	$158,134
Jelutong (Pontianak)	92,940	18,478	40,000	4,984
Guayule	25	31	.....	.....
Chicle	.....	.....	50,200	22,590

PHILADELPHIA

IMPORTS

Rubber manufactures. *dutiable*	.....	$3	.....	$1,217

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$139,012	.....	$119
Inner tubes	.....	20,878	.....	.....
Belting, hose, and packing	.....	27,898	.....	6,440
Rubber boots and shoes. *pairs*	2,373	5,775	.....	.....
Druggists' sundries	.....	81	.....	.....
Other rubber manufactures	.....	490	.....	591
Totals, manufactured	.....	$194,134	.....	$7,150
Insulated wire	.....	$5,428	.....	.....
Rubber scrap and reclaimed	29,465	4,249	.....	.....

NEW ORLEANS

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Mexico	300	$68	.....	.....
Totals, unmanufactured	300	$68	.....	.....
Chicle *dutiable*	8,719	$6,260	.....	.....
Rubber manufactures. *dutiable*	.....	.....	.....	$7

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$50,698	.....	$9,600
Inner tubes	.....	7,699	.....	1,436
Belting, hose, and packing	.....	8,611	.....	8,052
Rubber boots and shoes. *pairs*	9,267	12,581	8,912	12,034
Soles and heels	.....	2,525	.....	859
Druggists' sundries	.....	75	.....	505
Other rubber manufactures	.....	7,050	.....	599
Totals, manufactured	.....	$89,239	.....	$33,085
Insulated wire	.....	$6,900	.....	$3,367

OHIO

IMPORTS

	May 1920 Pounds	May 1920 Value	May 1921 Pounds	May 1921 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements.	240,409	$141,242	.....	.....
Totals, unmanufactured...	240,409	$141,242	.....	.....
Rubber manufactures.*dutiable*	.....	.....	.....	$718

EXPORTS

MANUFACTURED				
Automobile and other tires..	.....	.....	.....	$34,952
Inner tubes	.....	.....	.....	830
Belting, hose, and packing..	.....	.....	.....	57
Other rubber manufactures..	.....	$34	.....	151
Totals, manufactured...	.....	$34	.....	$35,990
Rubber scrap and reclaimed.	.....	.....	93,291	$6,993

SAN FRANCISCO

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Canada	.....	.....	33,435	$6,691
Straits Settlements..	1,036,866	$601,766	101,096	28,728
Dutch East Indies..	131,349	56,664	.....	.....
Japan	34,944	17,748	.....	.....
Totals	1,203,159	$676,178	134,531	$35,419
Jelutong (Pontianak).....	11,169	2,180	.....	.....
Totals, unmanufactured.	1,214,328	$678,358	.....	.....
Rubber manufactures.*dutiable*	.....	$482	.....	$893

EXPORTS

MANUFACTURED				
Automobile and other tires..	.....	$189,549	.....	$60,079
Inner tubes	.....	23,662	.....	4,784
Belting, hose, and packing..	.....	75,138	.....	13,905
Rubber boots and shoes.*pairs*	3,107	3,698	1,687	2,330
Soles and heels.....	.....	3,318	.....	386
Druggists' sundries	.....	7,685	.....	1,041
Other rubber manufactures..	.....	32,150	.....	2,062
Totals, manufactured...	.....	$335,200	.....	$84,587
Insulated wire	.....	$8,250	.....	$22,026
Rubber scrap and reclaimed.	179,118	8,901	.....	.....

FOREIGN EXPORTS

Gutta percha.....	1	$2	.....	.....

WASHINGTON

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Canada	.....	.....	4,660	$792
Straits Settlements..	111,970	$48,000	.....	.....
Hongkong	180	90	.....	.....
Totals, unmanufactured.	112,150	$48,090	4,660	$792
Rubber manufactures.*dutiable*	.....	$166	.....	$31

EXPORTS

MANUFACTURED				
Automobile and other tires..	.....	$77,933	.....	$610
Inner tubes	.....	7,335	.....	2
Belting, hose, and packing..	.....	19,786	.....	309
Rubber boots and shoes.*pairs*	268	1,080	240	403
Soles and heels.....	.....	7,287	.....	805
Druggists' sundries	.....	123	.....	121
Other rubber manufactures..	.....	2,963	.....	3,220
Totals, manufactured...	.....	$116,507	.....	$5,470
Insulated wire	.....	$454	.....	$57
Rubber scrap and reclaimed.	44,634	1,765	123,195	2,888

CHICAGO

IMPORTS

Rubber scrap and reclaimed.	.....	.....	65,594	$1,800
Rubber manufactures.*dutiable*	.....	$12,446	.....	15,879
Chicle .....*dutiable*	228,138	128,946	434,652	233,589

MICHIGAN

IMPORTS

Rubber scrap and reclaimed.	.....	$130	.....	.....
Rubber manufactures.*dutiable*	.....	2,925	.....	.....

EXPORTS

MANUFACTURED				
Automobile and other tires..	.....	$40,754	.....	$13,385
Inner tubes	.....	7,753	.....	342
Belting, hose, and packing..	.....	2,440	.....	2,220
Rubber boots and shoes.*pairs*	5,272	18,157	360	1,086
Soles and heels.....	.....	857	.....	.....
Druggists' sundries	.....	2,362	.....	620
Other rubber manufactures..	.....	17,959	.....	8,817
Totals, manufactured...	.....	$90,282	.....	$26,474
Insulated wire	.....	$7,321	.....	$5,424
Rubber scrap and reclaimed.	171,071	25,354	4,715	292

IMPORTS OF CRUDE RUBBER INTO THE UNITED STATES BY CUSTOMS DISTRICTS

CUSTOMS DISTRICTS	June, 1921 Pounds	June, 1921 Value
Massachusetts	329,590	$31,165
New York	33,479,406	5,605,708
Maryland	227,500	99,769
San Diego	33,099	15,612
Los Angeles	172,950	27,544
San Francisco	207,213	28,558
Oregon	11,470	4,077
Washington	118,720	14,795
Colorado	44,800	4,589
Totals	34,624,748	$5,831,817

RUBBER STATISTICS FOR THE DOMINION OF CANADA

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom.....	403,302	$256,326	.....	.....
United States	232,178	96,446	1,049,015	$174,921
Belgium	4,306	2,050	9,682	1,783
Brazil	73,650	39,013	70,400	12,667
British East Indies				
Ceylon	33,600	22,468	478,035	167,949
India	5,300	1,974	.....	.....
Straits Settlements.	852,845	478,980	728,020	169,860
France	11,310	7,591	.....	.....
Total	1,616,491	$904,848	2,335,152	$527,180
Rubber, recovered.....	235,617	37,656	27,365	2,344
Rubber, powdered, and rubber or gutta percha scrap.....	200,831	7,355	134,620	9,118
Rubber substitutes	153,970	21,244	8,616	2,045
Totals, unmanufactured..	2,206,909	$971,103	2,505,753	$540,687
PARTLY MANUFACTURED—				
Hard rubber sheets and rods.	4,952	$2,878	638	$447
Hard rubber tubes.....	.....	1,859	.....	2,634
Rubber thread, not covered...	4,240	6,373	2,664	3,536
Totals, partly manufactured.	9,192	$11,110	3,302	$6,617
MANUFACTURED—				
Belting	.....	$16,275	.....	$6,610
Hose	.....	6,243	.....	6,848
Packing	.....	6,929	.....	4,246
Boots and shoes.....	.....	59,178	.....	6,720
Clothing, including waterproofed	.....	25,061	.....	18,701
Gloves	.....	549	.....	774
Hot-water bottles	.....	2,496	.....	1,065
Tires, solid	.....	20,835	.....	7,161
Tires, pneumatic	.....	149,214	.....	60,770
Inner tubes	.....	7,532	.....	4,531
Elastic, round or flat.....	.....	45,420	.....	21,266
Mats and matting.....	.....	202	.....	577
Cement	.....	3,501	.....	1,950
Other rubber manufactures...	.....	126,023	.....	146,386
Totals, manufactured..	.....	$469,458	.....	$287,605
Totals, rubber imports..	2,216,101	$1,451,671	2,509,055	$834,909
Insulated wire and cables				
Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$11,078	.....	$12,584
Copper wire and cables, covered as above.....	.....	11,981	.....	6,964
Chicle	.....	.....	252	97
Fillets	.....	661	.....	.....
Webbing	.....	101,061	.....	20,059
Fountain pens	.....	3,066	.....	776

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

	April 1920 Produce of Canada Value	April 1920 Reexports of Foreign Goods Value	April 1921 Produce of Canada Value	April 1921 Reexports of Foreign Goods Value
UNMANUFACTURED—				
Crude and waste rubber.....	$15,014	$1,751	$2,024	$1,302
MANUFACTURED—				
Belting	$2,017	.....	$298	.....
Hose	4,786	.....	5,139	.....
Boots and shoes.....	115,529	.....	38,271	14
Clothing, including waterproofed	930	.....	1,503	358
Tires, pneumatic	929,006	.....	86,080	.....
Tires	440	10,746	1,319	1,781
Other manufactures	28,229	1,433	8,750	9,721
Totals, manufactured..	$1,080,937	$12,179	$141,360	$11,874
Totals, rubber exports.	$1,095,951	$13,930	$143,384	$13,176
Chicle	.....	.....	$3,396	.....

UNITED KINGDOM RUBBER STATISTICS

IMPORTS

	May 1920 Pounds	May 1920 Value	May 1921 Pounds	May 1921 Value
UNMANUFACTURED—				
Crude rubber				
From—				
Straits Settlements	1,081,200	£126,976	5,149,200	£240,642
Federated Malay States	2,902,000	340,596	4,839,000	240,321
British India	1,347,500	157,435	996,900	48,503
Ceylon and dependencies	1,537,700	169,157	2,526,000	124,019
Other Dutch possessions in Indian Seas	372,700	44,672	929,600	47,208
Dutch East Indies (except other Dutch possessions in Indian Seas)	638,600	75,987	2,153,500	115,490
Other countries in East Indies and Pacific, not elsewhere specified	188,300	21,079	247,900	12,035
Brazil	2,988,600	310,858	177,100	7,617
Peru	1,000	31	5,600	270
South and Central America (except Brazil and Peru)	16,200	1,590	5,000	250
West Africa				
French West Africa	540,500	47,502	22,400	746
Gold Coast	500	22	22,800	1,320
Other parts of West Africa	76,000	5,957	14,900	671
East Africa including Madagascar	143,200	15,110	56,600	1,920
Other countries	199,900	18,493	2,200	105
Totals	12,033,900	£1,335,465	17,148,700	£840,817
Waste and reclaimed rubber	1,093,800	29,931	6,300	71
Totals, unmanufactured	13,127,700	£1,365,396	17,155,000	£840,888
Gutta percha and balata	980,100	174,813	377,000	67,128
Rubber substitutes	44,800	1,700	.....	.....
MANUFACTURED—				
Boots and shoes...*dozen pairs*	29,726	£79,943	5,239	£14,155
Waterproof clothing	.....	1,258	.....	110
Insulated wire	.....	2,197	.....	1,114
Tires and tubes	.....	315,041	.....	374,058
Other rubber manufactures	.....	63,202	.....	41,209

EXPORTS

UNMANUFACTURED—				
Waste and reclaimed rubber	1,741,200	£36,204	320,200	£9,933
Rubber substitutes	167,700	7,562	800	22
Totals	1,908,900	£43,766	321,000	£9,955
MANUFACTURED—				
Boots and shoes...*dozen pairs*	13,752	£30,852	6,640	£15,700
Waterproof clothing	.....	256,498	.....	36,088
Insulated wire	.....	142,619	.....	112,239
Submarine cables	.....	107,527	.....	807,090
Tires and tubes	.....	483,176	.....	137,434
Other rubber manufactures	.....	400,202	.....	139,409

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED—				
Crude rubber				
To Russia	6,500	£620	.....	.....
Sweden, Norway and Denmark	357,600	35,701	172,500	£13,605
Germany	1,344,900	139,660	1,165,900	38,524
Belgium	274,000	30,975	126,900	4,640
France	3,345,900	400,825	645,700	27,063
Spain	32,300	3,786	9,100	447
Italy	704,100	86,833	51,700	2,350
Austria-Hungary	62,400	6,692	130,300	3,291
Other European countries	67,800	7,228	250,600	5,818
United States	4,713,600	554,515	942,500	41,629
Canada	449,300	52,663	15,700	1,020
Other countries	219,500	27,299	28,500	1,526
Totals, rubber	11,577,900	£1,346,797	3,539,400	£139,913
Waste and reclaimed rubber	16,300	£664	.....	.....
Gutta percha and balata	171,700	32,298	36,800	£6,888
MANUFACTURED—				
Boots and shoes...*dozen pairs*	21	£191	28	£79
Insulated wire	.....	97	.....	.....
Tires and tubes	.....	10,941	.....	27,750
Other rubber manufactures	.....	6,040	.....	2,639

RUBBER STATISTICS FOR ITALY

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	January 1920 Quintals[1]	January 1920 Lire[2]	January 1921 Quintals	January 1921 Lire
UNMANUFACTURED—				
Crude rubber and gutta percha—raw and reclaimed:				
From French Colonies in Asia	312		....	
India and Ceylon	490		149	
Straits Settlements	...	1,294,850	2,228	3,680,300
French African Colonies	152		...	
Brazil	309		178	
Other countries	100		1,319	
Totals	1,363	1,294,850	3,874	3,680,300
Rubber scrap	11	1,650	...	.....
Totals, unmanufactured	1,374	1,296,500	3,874	3,680,300

	January 1920 Quintals[1]	January 1920 Lire[2]	January 1921 Quintals	January 1921 Lire
MANUFACTURED—				
India rubber and gutta percha—				
Threads	13	37,700	31	89,900
Sheets, including hard rubber	1	1,000	2	3,800
Tubes	1	1,400	25	34,750
Belting	56	92,400	37	61,050
Rubber-coated fabrics in pieces	14	29,200	31	65,400
Boots and shoes...*pairs*	13,030	260,600	38	760
Elastic webbing	3	10,200	18	61,200
Clothing and articles for travel	8	32,000	18	72,000
Tires and tubes—				
From Belgium	148		.....	
France	2		460	
Great Britain	302	1,274,000	562	2,867,200
United States	3		.....	
Other countries	.....		2	
Other manufactures	266	502,700	640	1,207,600
Totals, manufactured	.....	2,241,200	.....	4,463,660
Total imports	.....	3,537,700	.....	8,143,960

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To United States	245	122,500	.....	258,500
Other countries	.....		517	
Totals	245	122,500	517	258,500
Waste	180	36,000	358	71,600
Totals, unmanufactured	425	158,500	875	330,100
MANUFACTURED—				
India rubber and gutta percha—				
Threads	50	155,000	3	9,300
Sheets, including hard rubber	50	71,000	18	23,400
Tubes	54	67,600	78	98,000
Rubber-coated fabrics in pieces	9	27,000	6	18,000
Elastic webbing	28	106,400	34	129,200
Clothing and articles for travel	1	5,000	9	45,000
Tires and tubes:				
To Austria	9		73	
Belgium	3		135	
France	.....		2	
Great Britain	.....		865	
Spain	4		43	
Switzerland	69	230,000	9	4,467,500
India and Ceylon	.....		175	
Dutch East Indies	.....		225	
Argentina	.....		116	
Brazil	1		.....	
Other countries	6		144	
Other rubber goods	213	395,800	357	681,200
Totals, manufactured	.....	1,057,800	.....	5,471,600
Total exports	.....	1,216,300	.....	5,801,700

[1] One quintal equals 220.46 pounds.
[2] One lira equals $0.193 (normal).

THE MARKET FOR COTTON AND OTHER FABRICS

NEW YORK

AMERICAN COTTON. The lack of trade buying has been the primary cause of the quiet conditions ruling in the spot cotton market during July. Prices have fluctuated from 10 to 35 points, showing a tendency to lower values at the end of the month. On July 1, spot middling uplands was quoted at 12 cents as compared with 40 cents a year ago. During the first part of the past month prices fluctuated mildly and on July 21, recorded 12.85 cents, the highest figure for the month. The absence of trade interest carried values to lower levels and quotations for spot middling uplands were 12 cents on July 26.

EGYPTIAN COTTON. This market has shown a little life during this past month, and prices have therefore stiffened somewhat. Medium grades of uppers have sold around 16 cents, c. i. f. Boston. Although neglected, medium grades of Sakellarides have been bought at 28 to 30 cents, duty paid. Crop reports from Egypt are not good as a water shortage is feared. The plant got a late start and is progressing slowly under adverse conditions.

ARIZONA COTTON. Arizonas have been moving slowly on a basis of 32 cents for extra. Reports from Phoenix indicate that a great deal of cotton is for sale there. The crop is progressing favorably, but, this acreage being reduced, it is estimated that not over 30,000 bales will be ginned.

SEA ISLAND COTTON. This market has been quiet although some business has been done in extra choice at 40 cents. Reports indicate that an acreage was planted slightly larger than last year, but the ultimate yield depends on the boll-weevil menace.

MECHANICAL DUCKS AND DRILLS. Considerable activity has been noted in this market, resulting in firmer prices, and higher quotations on some fabrics. The broad inquiry developed during the past month reflects the improved condition in the rubber manufacturing industry.

RAINCOAT FABRICS. Business in these materials has been quiet and slow with small inquiry from the manufacturers. Prices have not shown any radical changes.

SHEETINGS. The market for light weight sheeting has been stronger, but 40-inch goods are still going slowly at bottom prices. Buying is spasmodic and lacks healthy activity. The rubber trade is actually showing very little interest in sheetings at present.

TIRE FABRICS. The well-defined improvement in tire production has not yet been felt in this market which continued to be upset. The wide range of prices that are being quoted on tire fabrics effectively discourages buying except on a hand-to-mouth basis.

NEW YORK QUOTATIONS

July 25, 1921

Prices subject to change without notice

BURLAPS			
32—7-ounce	100 *yards*	@	
32—8-ounce		@	
40—7½-ounce		@	
40—8-ounce		@	
40—10-ounce		@	
40—10½-ounce		@	
45—7½-ounce		@	
45—8-ounce		@	
45—10-ounce		@	
DRILLS			
38-inch 2.00-yard	*yard*	.12½	@
40-inch 3.47-yard		.07¼	@
52-inch 1.90-yard		.14¾	@
52-inch 1.95-yard		.14½	@
60-inch 1.52-yard		.18⅛	@
DUCK			
CARRIAGE CLOTH			
38-inch 2.00-yard enameling duck	*yard*	.13	@
38-inch 1.74-yard		.13⅛	@
72-inch 16.66-ounce		.31¼	@
72-inch 17.21-ounce		.32¼	@
MECHANICAL			
Hose	*pound*	.24	@
Belting		.25	@
HOLLANDS, 40-INCH			
Acme	*yard*	.20	@
Endurance		.22½	@
Penn		.25½	@
DEAD FINISH			
Piece		.20	@
Cut		.25	@
FLAT FINISH			
Piece		.16½	@
Cut		.18½	@
LONSDALE			
White		.48	@
Green or blue		.56	@
Colors		.51	@
NAINSOOKS			
White		.18	@ .21½
Flesh		.22	@
RAINCOAT FABRICS			
COTTON			
Bombazine 64 x 60	*yard*	.12½	@
60 x 48		.11½	@
Cashmères, cotton and wool, 36-inch, tan		.60	@
Twills 64 x 72		.10	@ .12
60 x 102		.14	@
Twill, mercerized, 36-inch, blue and black		.26½	@
tan and olive		.24½	@
Tweed		.40	@ 1.00
printed		.18	@
Plaids 60 x 48		.10	@
56 x 44		.11	@
Repp		.24	@
Prints 60 x 48		.13	@
64 x 60		.14	@
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES			
63-inch, 3¼ to 7½ ounces	*yard*	@	
36-inch, 2¾ to 5 ounces		@	
IMPORTED PLAID LINING (UNION AND COTTON)			
63-inch, 3½ to 7 ounces	*yard*	@	
36-inch, 2 to 4 ounces		@	
SHEETINGS, 40-INCH			
48 x 48, 2.50-yard		.09½	@
48 x 48, 2.85-yard		.08½	@
64 x 68, 3.15-yard		.09¾	@
56 x 60, 3.60-yard		.08¼	@
48 x 44, 3.75-yard		.07	@
SILKS			
Canton, 38-inch	*yard*	.27½	@
Schappe, 36-inch		.45	@
STOCKINETTES			
SINGLE THREAD			
3½ Peeler, carded	*pound*	@	
4½ Peeler, carded		@	
6½ Peeler, combed		@	
DOUBLE THREAD			
Zero Peeler, carded	*pound*	@	
3½ Peeler, carded		@	
6½ Peeler, combed		@	
TIRE FABRICS			
BUILDING			
17¼-ounce Sakellarides, combed	*pound*	.90	@
17¼-ounce Egyptian, combed		.70	@
17¼-ounce Egyptian, carded		.65	@
17¼-ounce Peelers, combed		.70	@
17¼-ounce Peelers, carded		.52	@

CORD			
15-ounce Egyptian	pound	.76	@
BICYCLE			
8-ounce American	pound		@
10-ounce American			@
CHAFER			
9¼-ounce Sea Island	pound		@
9¼-ounce Egyptian, carded		.80	@
9¼-ounce Peeler, carded		.67	@

*Nominal.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS

NEW YORK

The beginning of the new quarter saw no new prices for leads, zinc oxide or lithopone. In general, business in the usual list quoted in these columns has been routine with tendency to normal demand in a few items, notably zinc oxide and lithopone. Continued improvement in tire production is reported from the Akron district. In other rubber manufacturing lines increase of activity has not been as marked.

Aniline Oil. Supplies are abundant but demand has been limited to small quantities. Prices early in the month ranged from 19 to 26 cents a pound, closing at 20 to 25 cents.

Barytes. Imports of German barytes have been of small volume. Consumption has shown an increase with prices holding steady the entire month.

Benzol. Owing to the curtailment of coke production from which the bulk of benzol is derived as a by-product, the supply of benzol has been greatly restricted. It is much in demand, both here and abroad, as a source of motor fuel. Recent large export orders have been filled with difficulty. The active demand for 90 per cent benzol has produced a scarcity of the pure grade.

Blanc Fixe. During most of the month business ruled dull although an improvement has latterly been reported.

Blue Lead. The price has been maintained steadily at 7¼ to 7½ cents a pound. An improvement in the demand has been noted.

Cadmium Sulphide. Early in the month supplies for the rubber trade were quite active with better inquiry continuing as the month progressed. Prices steady at $1.10 to $1.35 a pound.

Carbon Bisulphide. The middle of the month was marked by improvement in business from the rubber trade. The market was active at 6 to 7½ cents a pound.

Carbon Tetrachloride. This solvent was in much less demand than carbon bisulphide, although conditions improved in this regard as the month progressed.

China Clay. This material was fairly active. Large arrivals of foreign stock had no influence on prices.

Dry Colors. Radical reduction in the prices of iron blues failed to increase demand and business in most colors ran under normal.

Gas Black. Following routine inquiry, the latter part of the month showed an increase in business from the rubber trade.

Litharge. Slow movement of stocks marked trade in litharge with no change in prices.

Lithopone. Same prices were announced for the third as ruled in the second quarter of the year. Certain manufactures are busy and the material is in good demand.

Solvent Naphtha. This market has been quiet. Prices range from 24 to 28 cents a gallon.

Sublimed Lead. Some improvement in demand. Prices unchanged and the outlook reported hopeful.

Sulphur. Business routine at steady prices.

Talc. There are ample stocks of all grades. Prices are steady and domestic grades are in fair demand.

Whiting. The market has been dull for the month with price reductions toward the close, of five to ten cents a 100 pounds.

Zinc Oxide. Prices on all grades were reduced July 1 from ⅝ to 1¼ cents a pound to stimulate business. The desired effect was produced and demand from the rubber tire trade increased. Consumption is rapidly resuming normal proportions.

NEW YORK QUOTATIONS

July 25, 1921

Prices subject to change without notice

ACCELERATORS, ORGANIC				
Accelerene (f. o. b. English port)	lb.	13s.	@	
Accelemal (bbl.)	lb.	$0.60	@	
Adeo	lb.	.75	@	
Aldehyde ammonia crystals	lb.	.95	@	1.00
Aniline oil (drums extra)	lb.	.20	@	.25
Excellerex	lb.	.55	@	.75
Formaldehyde aniline	lb.	.60	@	.65
Hexamethylene tetramine	lb.	.95	@	1.00
Lead oleate (drums, 500 lbs.)	lb.	.13½	@	
N. C. C.	lb.	.45	@	
No. 999	lb.	.14	@	
Paradin	lb.	.70	@	
Paraphenylene diamine	lb.	1.75	@	2.00
Thiocarbanilide	lb.	.45	@	.65
Vulcocene	lb.	.35	@	
X L O	lb.	2.00	@	
ACCELERATORS, INORGANIC				
Lead, dry red	lb.	.10	@	
sublimed blue	lb.	.07¼	@	.07½
sublimed white	lb.	.07¼	@	
white, basic carbonate	lb.	.07½	@	.08
Lime, flour	lb.	.02	@	.02½
Litharge, domestic	lb.	.08¾	@	.09¾
imported	lb.	.17	@	
sublimed	lb.		@	
Magnesium, carbonate, light	lb.	.08	@	.10
calcined light	lb.	.25	@	.30
extra light	lb.	.50	@	
medium light	lb.	.25	@	
calcined heavy (bbl.)	lb.	.06½	@	.07
ACIDS				
Acetic 28 per cent	lb.	.02½	@	
glacial, 99 per cent	lb.	.11½	@	
Cresylic (97% straw color)	gal.	.80	@	
(95% dark)	gal.	.75	@	
Muriatic, 20 degrees	lb.	.02	@	
Nitric, 36 degrees	lb.	.05¾	@	
Sulphuric, 66 degrees	lb.	.01½	@	
ALKALIES				
Caustic soda	lb.	.04	@	.04½
Soda ash, 58%	cwt.	1.90	@	2.25
COLORS				
Black				
Bone, powdered	lb.	.06½	@	.08½
Carbon black (sacks, factory)	lb.	.10½	@	.20
pressed	lb.		@	
Dipped goods	lb.	1.00	@	
Drop	lb.	.07	@	.16
Ivory black	lb.	.15	@	.45
Lampblack	lb.	.15	@	
Oil soluble aniline	lb.	.95	@	
Rubber black	lb.	.10	@	.16
Rubber makers' non-flying black	lb.	.40	@	
Blue				
Cobalt	lb.	.25	@	.30
Dipped goods	lb.	1.00	@	
Prussian	lb.	.50	@	
Rubber makers' blue	lb.	3.50	@	
Ultramarine	lb.	.16	@	.35
Brown				
Iron oxide	lb.	.04	@	.06
Sienna, Italian, raw and burnt	lb.	.06½	@	.12½
Sienna, Italian, raw (tan color)	lb.		@	
Umber, Turkey, raw and burnt	lb.	.05½	@	.06½
Vandyke	lb.	.06	@	.10
Green				
Chrome, light	lb.	.32	@	.34
medium	lb.	.34	@	.39
dark	lb.	.43	@	.47
commercial	lb.	.12	@	
tile	lb.	.08	@	.17
Guignet	lb.	1.50	@	
Dipped goods	lb.	1.00	@	
Oxide of chromium	lb.	.55	@	
Rubber makers' green	lb.	3.50	@	
Red				
Antimony, crimson	lb.	.42	@	.51
crimson, E. 15/17% (bbls.)	lb.	.48	@	
crimson, F	lb.	.35	@	
crimson, R. M. P.	lb.	.55	@	
Antimony, golden	lb.	.22½	@	.27
golden, R. M. P.	lb.	.25	@	
golden 1	lb.	.30	@	
golden 2	lb.	.25	@	
golden, E. 15/17% (bbls.)	lb.	.25	@	
7-A	lb.	.42	@	
vermilion	lb.	.55	@	
red sulphuret	lb.	.25	@	
Arsenic, red sulphide	lb.	.12½	@	
Dipped goods, red	lb.	1.00	@	
purple	lb.	1.00	@	
orange	lb.	1.00	@	
Indian	lb.	.13½	@	
Iron oxide, reduced grades	lb.	.04	@	.13½
pure bright	lb.	.15½	@	

COLORS—Continued

Maroon oxide	lb.	$0.13½	@
Oil soluble aniline, red	lb.	1.75	@ 2.00
orange	lb.	1.50	@
Oximony	lb.	.17½	@
Para toner	lb.	1.40	@
Red excelsior	lb.		@
Rubber-makers' red (four shades)	lb.	3.50	@
purple	lb.	2.50	@
Spanish natural	lb.	.04½	@ .05
Toluidine toner	lb	2.75	@ 3.25
Venetian	lb.	.03	@ .06
Vermilion, American	lb.	.25	@ .30
permanent	lb.	.30	@
English quicksilver	lb.	.90	@ 1.00

White

Albalith	lb.	.07¼	@ .07½
Aluminum bronze	lb.	.60	@ .65
Lithopone, Beckton white	lb.	.07	@ .07½
Lithopone, domestic (factory)	lb.	.07	@ .07½
Ponolith (carloads, factory)	lb.		@
Rubber-makers' white	lb.		@
		C.L.	L.C.L.
Zinc oxide. American Horse Head (factory)	lb.	.08¾	@ .09¾
Special	lb.	.08¼	@ .08½
XX red	lb.	.08½	@
French process, Florence brand (factory):			
White seal	lb.	.11	@ .11¼
Green seal	lb.	.10	@ .10¼
Red seal	lb.	.09	@ .10½
White seal	lb.	.14	@
Azo (factory):			
ZZZ (lead free)	lb.	.07½	@ .08
ZZ (under 5% leaded)	lb.	.07¼	@ .07¾
Z (8-10% leaded)	lb.	.07	@ .07½

Yellow

Arsenic, yellow sulphide	lb.	.70	@
Cadmium, sulphide	lb.	1.10	@ 1.35
Chrome, light and medium	lb.	.21	@
C. P.	lb.	.21	@
Dipped goods	lb.	1.00	@
Ochre, domestic	lb.	.02½	@ .03½
imported	lb.	.04	@ .04½
Oil soluble aniline	lb.	1.60	@
Rubber makers' yellow	lb.	2.50	@ 3.50
Zinc chromate	lb.	.35	@

COMPOUNDING INGREDIENTS

Aluminum flake (carloads)	ton	25.00	@33.00
hydrate, light	lb.	.22	@ .25
Ammonium carbonate (lump)	lb.	.07½	@ .10
Asbestine	ton	20.00	@
Barium, carbonate precipitated	ton	85.00	@
dust	ton	100.00	@
Barytes, pure white (carloads)	ton	28.00	@30.00
off color (carloads)	ton	20.00	@25.00
uniform floated (carloads)	ton	28.00	@
Basofor	lb.	.05	@
Beta-naphthol	lb.	.46	@
Blanc fixe	lb.	.04½	@ .05
Bone ash	lb.		@
Carrara filler (factory)	ton.	16.00	@
Chalk, precipitated, extra light (f. o. b. factory)	lb.	.03½	@ .04¼
heavy (f. o. b. factory)	lb.	.02½	@ .03¼
China, clay, Dixie	ton	22.00	@32.00
Blue Ridge	ton	22.00	@32.00
domestic	ton	7.50	@ 9.00
imported	ton	16.00	@24.00
Cotton linters, clean mill run (factory)	lb.	.02½	@
Diatomite	lb.	.03½	@
Fossil flour (powdered)	ton	60.00	@
(bolted)	ton	65.00	@
Glue, high grade	lb.	.30	@ .40
medium	lb.	.24	@ .30
low grade	lb.	.16	@ .18
Graphite, flake (400-pounds bbl.)	lb.	.10	@
amorphous	lb.	.05	@
Ground glass FF. (bbls.)	lb.		@
Infusorial earth (powdered)	ton	60.00	@
(bolted)	ton	65.00	@
Liquid rubber	lb.	.15½	@
Mica, powdered	lb.	.15	@
Phenanthrene	lb.		@
Pumice stone, powdered (bbl.)	lb.	.03	@ .08
Rotten stone, powdered	lb.	.02½	@ .04½
Rubber paste	lb.		@
Silica, aluminum	ton	25.00	@30.00
gold bond	ton	28.00	@
silver bond	ton	22.00	@
Soap bark, powdered	lb.	.23	@
Soapstone, powdered (bags)	ton	15.00	@20.00
Starch, powdered corn (bags)	cwt.	2.33	@
(bbls.)	cwt.	2.61	@
Talc, powdered soapstone	ton	18.00	@20.00
Terra blanche	ton	25.00	@28.00
Tripoli flour, air-floated, cream or rose (factory)	ton	25.00	@
white (factory)	ton	27.00	@
Tyre-lith	ton	90.00	@
Whiting, Alba	cwt.	1.50	@ 1.80
Columbia	cwt.		@
commercial	cwt.	1.10	@ 1.20
Danish	ton	18.00	@
English cliffstone	cwt.	1.75	@ 2.00
gilders	cwt.	1.20	@ 1.35
Paris, white, American	cwt.	1.35	@ 1.50
Quaker	ton	13.00	@15.00
Superfine	ton	15.00	@17.00
Wood pulp, imported	ton		@
XXX	ton	34.00	@
X	ton	30.00	@
Wood flour	ton	35.00	@40.00

MINERAL RUBBER

Elateron (c. l. factory)	ton		@
(l. c. l. factory)	ton		@
Gilsonite	ton	$70.00	@
Genasco (c. l. factory)	ton	50.00	@
(l. c. l. factory)	ton	52.00	@
Hard hydrocarbon	ton	35.00	@45.00
Soft hydrocarbon	ton	30.00	@40.00
320 M. P. hydrocarbon (c. l. factory)	ton	50.00	@55.00
(l. c. l. factory)	ton	57.50	@
300/310 M. P. hydrocarbon (c. l. factory)	ton	40.00	@
(l. c. l. factory)	ton	45.00	@
M. R. X	ton		@
Pioneer, M. R. (c. l. factory)	ton	46.00	@
(l. c. l. factory)	ton	48.00	@
Raven M. R.	ton		@
Robertson, M. R. pulverized (c. l. factory)	ton		@
M. R. pulverized (l. c. l. factory)	ton		@
M. R. (c. l. factory)	ton	52.50	@
M. R. (l. c. l. factory)	ton	55.00	@
Rubrax (factory)	ton	50.00	@
States "A" (c. l. factory)	ton	43.00	@
No. 1 (c.-l. factory)	ton	38.00	@
Synpro, granulated, M. R. (factory)	ton	59.50	@75.00

OILS

Avoilas compound (bbl.)	lb.	.14	@
(kegs)	lb.	.18	@
Castor, No. 1, U. S. P.	lb.	.10½	@
No. 3, U. S. P.	lb.	.09	@
Corn	lb.		@
refined	lb.		@
Cotton	lb.	.09½	@
Glycerine (98 per cent)	lb.	.14½	@ .15
Halowax	lb.	.26	@
Linseed, raw	gal.	.75	@
Linseed compound	gal.		@
Palmoline	lb.		@
Palm niger	lb.	.07½	@
Peanut	lb.	.10	@
Petrolatum, standard	lb.	.05	@ .07
Petrolatum, sticky	lb.	.10	@ .12
Pine, steam distilled	gal.	1.10	@ 1.30
Rapeseed, refined	lb.	.11	@
blown	lb.	.12	@
Rosin	gal.	.38	@ .45
Synpro	gal.	.35	@ .60
Soya bean	lb	.08	@
Tar	gal.	.30	@ .37

RESINS AND PITCHES

Cantella gum (carloads)	lb.	.50	@
Cumar resin, hard	lb.	.09	@ .13
soft	lb.	.09	@ .13
Tar, retort	bbl.	12.00	@
kiln	bbl.	11.50	@
pine retort	bbl.	14.00	@
Pitch, Burgundy	lb.	.05	@ .05½
coal tar	ton	20.00	@
pine tar	lb.	.03½	@
ponto	lb.	.10	@
Rosin, K (bbl.)	280 lbs.	5.70	@
strained (bbls.)	280 lbs.	5.00	@
Shellac, fine orange	lb.	.84	@ .90

SOLVENTS

Acetone (98.99 per cent, drums [6.62 lbs. per gal.])	lb.	.12½	@ .13½
Benzol (water white, 90% [7.21 lbs. per gal.])	gal.	.25	@ .31
pure (drums, extra)	gal.	.27	@ .38
Carbon bisulphide (drums [10.81 lbs. per gal.])	lb.	.06¾	@ .07½
tetrachloride (drums [13.28 lbs. per gal.])	lb.	.11	@ .12½
Paracymene (factory)	gal.	5.00	@
Motor gasoline (steel bbls.)	gal.	.23½	@
73@76 degrees (steel bbls.)	gal.		@
68@70 degrees (steel bbls.)	gal.		@
Naphtha, V. M. & P. (steel bbls.)	gal.	.23	@
solvent (drums extra)	gal.	.32	@
Toluol, pure (7.21 lbs. per gal.)	gal.	.28	@ .34
Turpentine, spirits	gal.	.61	@
wood	gal.	.59	@
Xylol, pure (7.21 lbs. per gal.)	gal.	.40	@ .43
commercial	gal.	.28	@ .35

SUBSTITUTES

Black	lb.	.08	@ .14
White	lb.	.10	@ .16
Brown	lb.	.12	@ .15
Brown factice	lb.	.07	@ .15
Rubber factice	lb.	.03¾	@
White factice	lb.	.08	@ .16
Paragol, soft and medium	cwt.	6.81	@
hard	cwt.	6.81	@

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.40	@
Orange mineral, domestic	lb.	.11¼	@ .13½
Sulphur chloride (jugs)	lb.	.20	@
(drums)	lb.	.08	@
Sulphur, flour, Brooklyn brand (carloads)	cwt.		@
Brooklyn brand (less carload)	cwt.		@
Bergenport brand (bbls.)	cwt.	2.55	@
(bags)	cwt.	2.30	@
superfine (carloads, factory)	cwt.		@

(See also Colors—Antimony.)

WAXES

Wax, beeswax, white, commercial	lb.	.55	@
ceresine, white	lb.	.14	@
carnauba	lb.	.16	@
Montan	lb.	.07	@
ozokerite, black	lb.	.30	@
green	lb.	.30	@
paraffin	lb.	.03½	@ .08
sweet wax	lb.	.12	@

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